THE

# SOUTHERN AGRICULTURIST.

JUNE, 1831.

## PART I.

### ORIGINAL CORRESPONDENCE.

ART. I.—*Account of, and Directions for erecting a Sugar Establishment; by* J. HAMILTON COUPER.

(Concluded from page 232.)

*Description of the manner of setting Sugar Kettles.*—*Plates* 3, 4 and 5 represent the mode of setting four hemispherical kettles and two flat receivers to the same fire-place.

*Plate* 3 is the plan of the kettles, taken at the line E, E, of plate 4; in which F, is the *teach* containing, to the lips, 80 gallons; G, the *flambeau* of 122 gallons; H, the *propre* of 188 gallons; I, the *grand* of 263 gallons, and K, K, two *receivers* of 300 gallons each. The interior circles (1) represents the junction of the bodies and lips of the kettles; the next (2) the outer edges of the lips; the third (3) the distances of the brick-work from the kettles at the line E, E,; and the dotted circles (4) the outer edge of the conical curvings above the lips.

*Plate* 4 is a longitudinal section of the kettles, receivers, &c. through the line A, A, of plate 3.

*Plate* 5 contains transverse sections of the kettles and masonry. Fig. 1, is a section through the centre of the *teach* F, at the line B, B, of plate 3. Fig. 2, a section of the *propre* kettle at the line C, C,; and fig. 3, a section of the *grand* kettle at the line D, D. The arches *n*, *p* and *r*, through which the flame passes from kettle to kettle, are represented, in perspective, by dotted lines, in the three figures of this plate.

As every part of the work is exposed to a great heat, none but the best materials should be employed; and no others are consistent with true economy. For the chimney and all parts of the masonry not exposed to the immediate contact of the fire, good clay-bricks, set in fresh, strong lime-mortar are sufficient: and, although a substitution of a casing of fire-bricks is recommended, common bricks may be used for the reverberatories around the *propre* and *grand* kettles H and I, and the fire space beyond them. Throughout the interior face of the furnace, all the bricks whether common or fire-bricks, which are exposed to direct contact with the flame, should be set in fire-clay; under the *teach* and *flambleau*, to the depth of 4 inches, and beyond them, as far as the chimney, to the depth of 2 inches. The thickness of the casing of fire-bricks should be,—around the *teach* and at all the arches between the kettles, 9 inches—4½ inches around the *flambeau;* and 2½ inches around the *propre* and *grand*. The parts of the bricks not set in fire-clay should be bedded in strong lime-mortar: the thickness of which should be somewhat less than that of the fire-clay, to counteract the greater contractibleness of the latter. This arrangement prevents the calcination of the lime-mortar, by interposing a stratum of clay between it and the fire; and the advantage of the stronger adhesion of the lime is, at the same time, secured to those parts of the bricks so remote from the fire as not to be exposed to very great heat. The curvings above the kettles are best formed by tiles or bricks, 12 inches long, 5 inches wide at one end and tapering to 3½ at the other, and 2 inches thick, set in a mortar made of newly slacked lime, cane ashes and boiling syrup.

The saddles *b*, *c* and *d*, plates 4 and 5, between the kettles, should be covered with sheet-lead as far down as the lower edge of the lips, and extending on each side 4 inches beyond the intersection of the curved lines, or as far as the washing of the juice extends, as it is ladled from one kettle to another

The parts of the furnace, plates 3, 4 and 5, are the ash-pit S, with its door M,; the fire-place Y, with its grate R, and feed-mouth L; the reverberatories around the kettles; the arches X, X, X, between the kettles, and the flues *r*, *s*, *s*, and N.

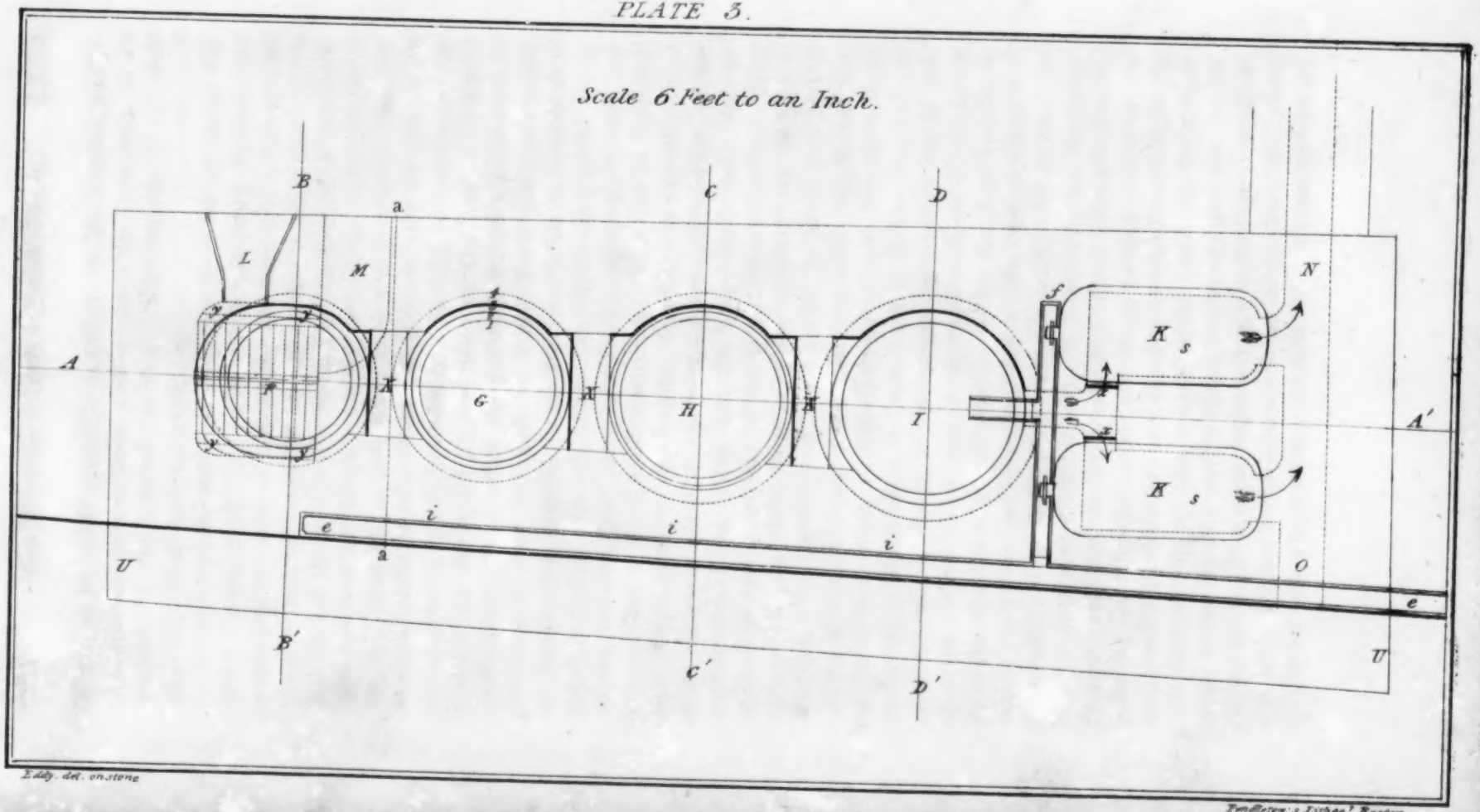
The ash-pit should be sunk 4 feet below the top of the grate, and be of the same size. This depth is necessary, that the vicinity of the coals at the bottom may not tend to warp the bars by placing them between two fires. Its door should be about $2\frac{1}{2}$ feet square and have an area greater than that of the air-passage between the grate-bars. When the dryness of the ground admits of it, it will be advantageous to sink the bottom of the ash-pit at least 2 feet below the foundation of the other parts of the work: and to prevent inconveniences to the fire-tender, from the heat of the coals, it should communicate with the air, by a curved passage terminating on one side of the feed-mouth. This arrangement offers the further advantages of obviating the effects of a strong wind blowing directly into the door, and of producing a draught through the grate in such a direction as to throw the flame of the fire immediately up to the bottom of the *teach*, and of preventing its being swept forward to the other kettles before it rises to the bottom and sides of the first. A door placed at the mouth of the ash-pit, regulates the admission of the air.

The dimensions of the fire-place must be in proportion to the size and number of kettles to be heated. For the system here represented, an area of 5 feet by 4 feet, with a grate occupying a space of 4 feet square, will be sufficient. The intervals between the bars for the passage of air should be about 1 $\frac{1}{10}$ inch wide. That the flame in its oblique passage to the chimney, may be brought in contact with the bottom and sides of that kettle, the centre of the grate is placed 9 inches from that of the *teach:* this position, should, however, vary with the strength of the draught being carried back when it is great, and forward when small. The grate-bars, to facilitate the introduction of fuel and the removal of coals, should be placed in a line with the feed-mouth. That the expansion of the iron may not occasion a pressure against the masonry, spaces of half an inch should be left at the ends of the bearing-bars, and at the sides and ends of the fire-bars. The feed-mouth, of cast-iron, bevels from the furnace to the outside of the wall: its interior diameter is 14 inches, and the exterior 23 inches. Although not common, it should be furnished with an iron door to regulate the admission of air. In some works, the position of the feed-mouth is reversed; the larger end being placed within: this arrangement is, however,

contrary to the West-India practice: is less convenient for the introduction of fuel, and exposes the cast-iron to be warped by the heat of the fire. The bottom of the feed-mouth is level with the grate-bars.

To prevent the ashes on the grate from being swept forward by the draught, and to reflect the flame upwards towards the bottom of the *teach*, the bench *v*, plate 4, and plate 5, fig. 1, is carried up 12 inches high in the centre, and curves up on the sides as far as the bottom of the *teach*. The walls of the furnace are carried up perpendicularly to the height of 24 inches, when they are gradually brought in on the side farthest from the chimney, and afterwards on the others, to meet the *teach* at a line 4½ inches below the junction of the lips with the body of the kettle. Plate 4 and plate 5, fig. 1, shew the points at which the curvatures commence; and the angle at which the brick-work meets the *teach;* this should, at all the kettles, be as obtuse as is consistent with strength, to prevent the burning of the syrup by the radiated heat from the bricks, when the kettles are emptied below the line of masonary. The bricks, forming the underpinning of the kettles, should be accurately fitted to them, particularly at the bottom edge; otherwise, as the mortar would soon drop out, the flame would penetrate so high as to heat the sides of the kettles above the line of the syrup in them. The bottom of the *teach* stands 30 inches above the top of the grate: and as the upper edges of the kettles are on the same level, this forms the regulating line of the whole work. The bottom of the reverberatory, under all of the kettles, is on a level with the bench *v;* in consequence of which, as the kettles increase in depth, the distances of their bottoms from the brick-work diminish from the *flambeau* to the *grand:* under the *flambeau* it is about 17 inches, at the *propre* 12½ inches, and at the *grand* 8 inches. The bed of the reverberatory, throughout its length, is of the form known in Louisiana as the boat-shaped; and has its cross sections nearly semi-circles, increasing in diameter under the large kettles. It may be described as a truncated cone, divided longitudinally through its centre, having the smaller end at the *teach* and the larger at the *grand* kettle; and with arches to support the kettles placed across it at right angles, and contracting it at those points. Its form is represented in figures 1, 2 and 3 of plate 5: the advantages resulting from it are, the contraction of

PLATE 3.


Scale 6 Feet to an Inch.
B
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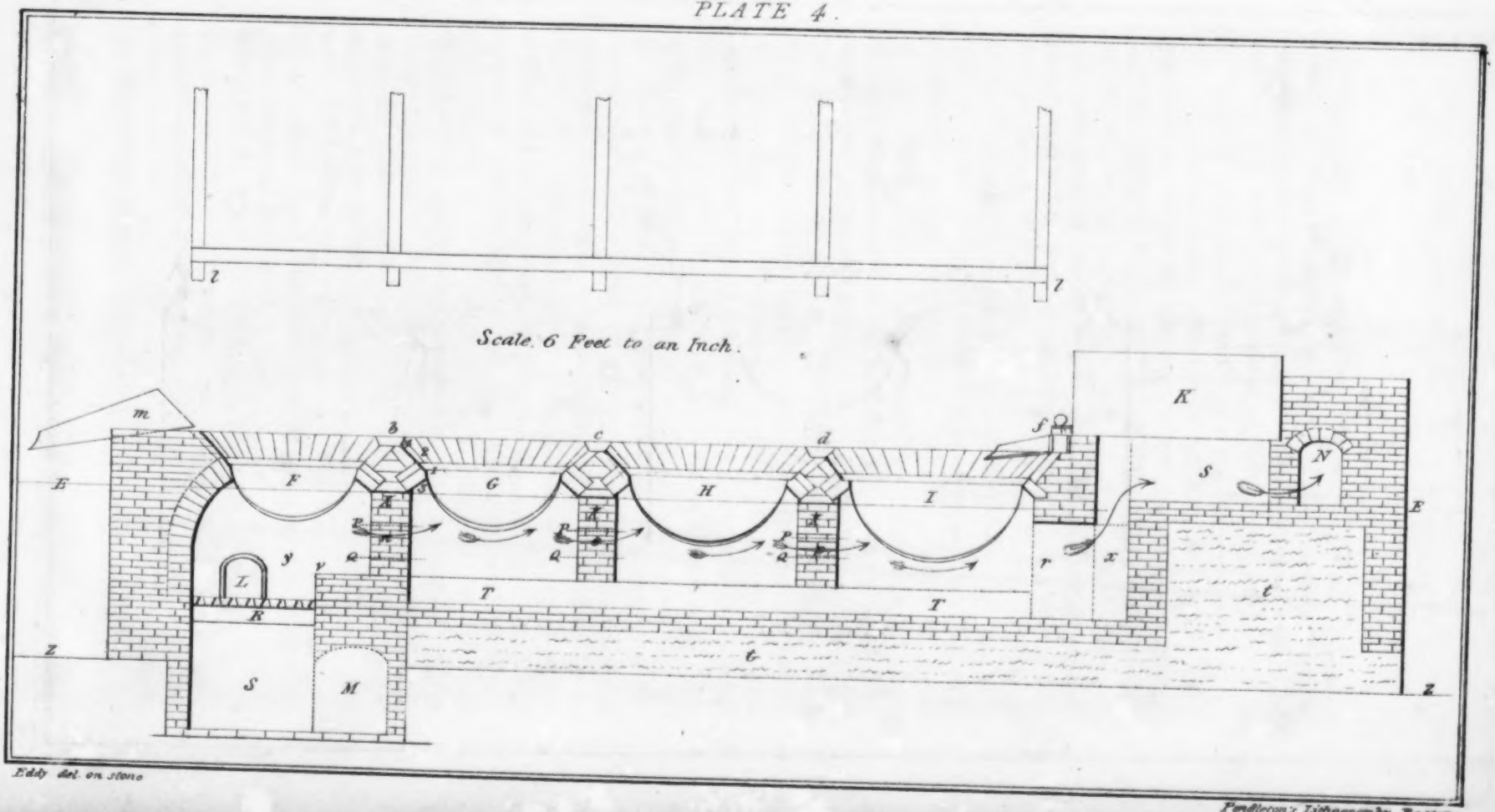
Eddy. del. on stone
Pendleton's Lithog.' Boston.

PLATE 5

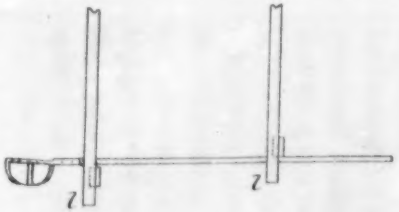
PLATE 4.




Eddy del. on stone

Pendleton's Lithography, Boston.

PLATE 5.




Scale, 6 Feet to an Inch.

Fig. 1

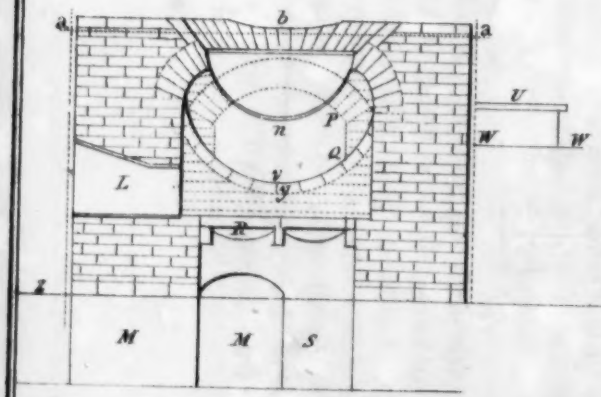



Fig. 2

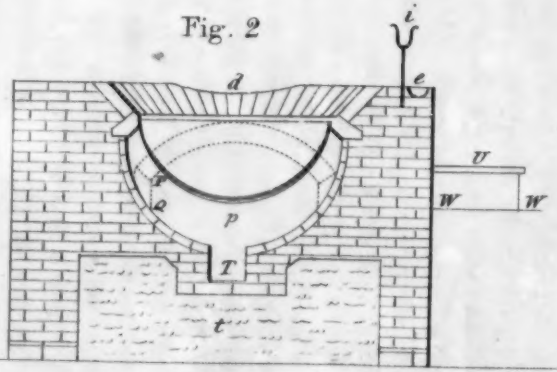
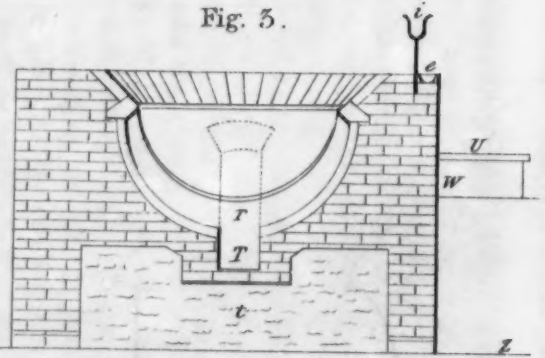



Fig. 3.




Eddy. del. on stone.

Pendleton's Lithography, Boston.

the flame in its passage under the kettles, and the radiation at right angles of the heat from the masonry to the vessels.

The distances between the upper edges of the inverted arches of the reverberatory and kettles at the line E, E, plate 4, are, at the *teach*, 6 inches, at the *flambeau* 5, at the *propre* 4, and at the *grand* 3.

The line of underpinning, where the brick-work meets the kettles, is for the *teach* 4½ inches, the *flambeau* 4 inches, the *propre* 3¼ inches, and the *grand* 2½ inches below the junction of the lip and body of each.

The arches X, X, X, thrown across the bed of the furnace between the kettles, serve in part to support them; and by contracting it, to reverberate the flame in its passage onwards. They are all a brick and a half thick and have a rise of 12 inches, with an arch 9 inches deep. The span of the first, between the *teach* and *flambeau*, (*n*, fig. 1, plate 5) is 3 feet 4 inches; of the second 3 feet 9 inches; and of the third, (*p*, fig. 2, plate 5,) 4 feet 2 inches. In plates 4 and 5, the lines Q, Q, Q, shew the points of the reverberatory from which the abutments commence, and P, P, P, and E, E, the spring and crown of the arches. As the arches form the weakest points of the masonry, and are most exposed to the action of the fire, too much attention cannot be paid to their construction; particularly to that of the first between the *teach* and *flambeau*. To prevent the expansion of the brick-work, bracing bars of iron, as represented by the dotted lines *a*, *a*, plates 3 and 4, should be placed at the first arch. They are made of a bar of iron an inch square, passing at the ends, by screws secured by nuts, through the heads of two other bars an inch and a half wide and ¾ of an inch thick placed on the outside of the masonry, and extending below its foundation. The horizontal bar *a*, *a*, should be brought nearly to the top of the saddle *b*, that by being removed from the action of the fire, its expansion may be less than that of the brick-work.

A trough T, T, a foot square, extends from the inside of the first arch to the end of the flue *r*: it serves to receive the dust from the reverberatory, and to afford a passage for cleaning the different kettles. To accomplish the latter object the workman enters the ash-pit and rasing some of the grate-bars, passes over the bench *v*, and through the arch *n* into the reverberatory. The dust collected is drawn

back to the arch, and being thrown into the ash-pit, is removed.

Beyond the grand kettle I, and at the farthest end of the reverberatory, commences the fleu *r*, one foot wide and three feet high: from it, two branches pass to the flues *s*, *s*, under the receivers K, K. The dampers *x*, *x*, regulate the alternate passage of the flame under the one or the other.

The fleu N, which is 2 feet high by 18 inches wide leads to the chimney. The end *o*, is only closed by bricks set without mortar joints, except the exterior face, which is pointed to the depth of an inch to prevent the escape of the smoke into the room; these bricks are removed when it is necessary to clean out the fleus N and *s*, *s*.

To obviate the risk of fire, the chimney is placed 4 feet from the building. The foundation, which should be prepared with great care is 7 feet square; but by three sets-off is reduced to 6 feet, 1 foot above it. The walls are then carried up, two bricks thick, to the height of 15 feet; leaving a smoke fleu of 2 feet square, which size it retains throughout. At the height of 15 feet, the walls diminish in thickness to the top when they are only 9 inches. As the strength of the draught materially depends on the height of the chimney, it is advantageous to make it as high as may be conveniently done: 50 feet may be recommended. At the bottom of the chimney fleu, and in the side of the fleu N, between the chimney and the building, cleaning doors, 24 inches by 18, closed with loose bricks should be left. The latter admits of regulating the draught of the chimney, if it be found too great, by diminishing the aperture of the fleu with a few bricks.

Above the upper edge of the kettles a conical curving of brick-work, with a slope corresponding to that of the lips, is carried to the height of 9 inches; and prevents the juice from flowing over as it froths up during the boiling. It is represented in plate 3 by the dotted lines (4); and is shewn in section in plates 4 and 5. It has usually, in the West-Indies, been formed by a covering of sheet-lead soldered to the lips of the kettles; but wedged-shape tiles or bricks are more durable and economical; and their employment limits the expense of the lead to the benches between the kettles. Particular attention should be paid, in laying the tiles, to make the joints water-tight; and their lower edges should pass an inch under the lips of the ket-

tles, to allow for their settling from the contraction of the masonry.

The saddles *b*, *c* and *d*, (plates 4 and 5,) are depressed in the centres, as shewn in fig. 1 and 2, (plate 5,) for the convenience of lading forward the juice, and to facilitate the flowing and skimming back of the syrup from the *teach* to the other kettles successively. To effect the latter object, the centre of the saddle *b*, is sunk 2½ inches below the top of the brick-work; that at *c*, 3½ inches, and at *d*, 4½ inches.

A wooden trough *e*, *e*, is placed on the edge of the brick work to receive the scums and washings of the kettles: with a sufficient descent to carry off its contents—it terminates in a scum tub on the outside of the building.

*Ys* of iron, as shown at *i*, *i*, *i*, (plates 3 and 5,) serve as fulcra in ladling forward the juice from kettle to kettle.

The receivers, which should exceed the grand kettle in capacity by about 50 gallons, ought to be furnished with large cocks, opening on a trough *f*, leading to the grand kettle and the scum-trough. The front, or side next to the grand kettle, being made 1½ inches deeper than the back; and the top being set level, there will be a descent of the bottom sufficient to run the juice off readily to the cocks. Two receivers are represented in the accompanying drawings, which are recommended: but it is proper to mention that they are not usually employed in Louisiana, and that wooden receivers may be substituted for them. In case the latter arrangement is adopted, the fleu *r*, should enter at once into that at N; and a single damper is to be placed in one or the other of them.

W, W, is the line of the floor of the boiling-room; which may be, with advantage, paved with brick or laid with tabby.

U, represents the platform on which the sugar-boilers stand. Its distance from the top of the brick-work should be 24 inches. The light, wooden frame *l*, *l*, (plates 4 and 5) forms a support for the ladles and skimmers when not in use; and a point of suspension for lamps.

The spaces *t*, *t*, represent a filling of rubbish.

It has not been thought necessary to give, in detail, the larger system, previously described and represented on a small scale in plates 1 and 2, as it will be sufficiently understood by a comparison of the plates; and as it is believed that the more simple and less expensive plan may be

better adapted to works which, to a certain extent, may be regarded as experimental.

The necessity of circumscribing this communication, already too much extended, to the limits of your journal, has prevented any other than brief notices of the principles on which the plans recommended are founded. A more full discussion of them would have relieved the observations made from an appearance of dogmatism; and would have enabled your readers to exercise their own judgment in modifying or rejecting what has been presented for their consideration. As the plans sent have, however, been formed from a comparison of detailed drawings of sugar-works in Louisiana, Jamaica and Demarara, it is believed that they may be recommended as being sanctioned by the practical experience of these countries.

Most respectfully, I am, dear, Sir, your obd't. serv't.

J. HAMILTON COUPER.

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## ART. II.—*On the Culture of Rice.*

(Extract of a letter from Mr. WM. B. M*****, of Wilmington, N. C. to Mr. J. Myrick, of Cooper River, with the reply of the latter.)

"Wilmington, N. C. January 16th, 1826.

*Sir*,—At a period when the science of agriculture is pursued with so much zeal, and when its votaries take so much pleasure in propagating its principles, to you, an apology can scarcely be necessary for the liberty I take in addressing to you this letter. I have read with much satisfaction the communications on Rice Planting, &c. published by order of the Agricultural Society of South-Carolina. Some of the principles there laid down in the management of a rice crop, are to us, in this quarter, new: and I should be much gratified by some more minute detail of the principles and reasons for the general management of rice crops. If the task is not too great, you will confer a favour on me, and others here, by giving me, as your leisure may make it convenient, answers to the subjoined queries, with any additional matter you may think useful where the gene-

ral management of rice planting is not well understood. Should it at any time and on any subject be in my power to reciprocate, I will most cheerfully do so.

Very respectfully, your obedient servant,

WM. B. M*****.

*Question* 1st.—How many inches deep do you dig or plough your lands?

2d. Do you make any difference, and if any what, in the depth of turning up strong and weak, stiff and light lands?

3d. Do you turn in your stubble, and if so does it not create injury by burying the shattered rice and thereby increasing the volunteer (red) rice?

4th. How do you avoid, or get rid of the shattered rice which produces the volunteer (red) rice?

5th. Is it better to turn in the stubble, or wait until you can burn off and then turn up the land?

6th. Do you flow your lands during winter, and if so, for what length of time, and how long before you plant, do you keep the water off?

7th. Would it succeed with lands which drain only from 2 to 2½ feet, to flow them all winter?

8th. Do your lands become quite dry in a week or ten days after the water is taken off when they have been flowed all winter?

9th. How many inches deep and wide are your trenches?

10th. Do you make any difference, and if any, what in the distance from centre to centre of your trenches, in strong and weak, stiff and light lands?

11th. How many inches deep do you usually hoe the first and second weedings?

12th. After the long flowing and when the water is taken off the rice when in belly, does not the rice stop growing and turn yellow in consequence of the water being kept off so long?

13th. Why do you take the water off the rice when it is in belly, is it *merely* to clean it of grass?

14th. What length of time usually intervenes between the first and second hoeings after the *long* flowing, and how long is it usually, between drawing off the water after the *long* flowing and returning it, on the appearance of the second joint?

15th. Do you generally wait for fields to dry, after the water is taken off, before you commence hoeing them, and is it preferable?

16th. Do you approve of taking off the water from fifteen to twenty days before you commence harvest as suggested by Mr. C. E. Rowand?

17th. If so, ought the water to be taken off while the rice is soft and in milk, or not until it begins to harden?

18th. By what criterion do you judge when to commence harvest?

19th. How wide are your trenching and weeding hoes?

20th. How many acres do you cultivate to the hand?

—

"Cooper River, (S. C.) March 10th, 1826.

*Sir*,—I received your letter of the 16th of January last; some time since; you are to attribute my long silence exclusively to a press of business and frequent calls from home. You judge correctly in supposing that it affords me pleasure to communicate to my fellow-labourers in the science of agriculture, the method I pursue in the cultivation of rice. Whatever knowledge I may possess on the subject is the result of experience, and such as I have practically found to be most congenial to the soil and climate of Cooper River. But whether best adapted to your locality is doubtful to me. I will endeavour to reply fully to your queries, and trust they may be satisfactory. Accept, Sir, my thanks for your offer to reciprocate.

Very respectfully, I am your obedient servant,

JORDAN MYRICK.

*Answer to query the* 1st.—The plough is not used for rice on Cooper River, the soil being too light. We dig the land, in winter, every second or third year, and turn it up about five or six inches.

2d. I would turn strong and stiff deeper than weak and light lands; in stiff clay land I would always plough or dig in the stubble as early as possible in winter; in light black land (such as ours) I would never turn it in, but always burn or hoe off.

3d. Turning in the stubble will create volunteer rice, except every grain be sprouted before the land is turned.

4th. We gather, by hand, all the *ears* of rice left on the land after harvest, then put on the water for few a days to

sprout the shattered rice or *grains*, taking care to turn off the water before frost; the stubble is burnt off as early in the winter as possible, and the birds, before we dig, eat all the grains that did not germinate. We exclude cattle of every description from our fields, for they trample in much shattered rice which will create volunteer.

5th. Answered above.

6th. We never flow our lands in winter, except mill-ponds; in weak lands, however, it might be beneficial to get the sediment. When the stubble is turned in I would flow in winter, and change the water whenever the sediment was deposited.

7th. I know of no advantage to be derived by flowing lands all winter that drain only 2 or 2½ feet. Our land drains from 4 to 5 feet.

8th. Our Cooper River land, when properly drained, will, except in wet weather, become perfectly dry in a week or ten days. For example, our mill-ponds which are flowed from November to April. Any land not properly drained must remain heavy and sobbed a long time.

9th. My trenches are 3 inches wide, and as shallow as possible, merely giving earth enough to cover or hide the rice.

10th. My trenches are 15 inches from centre to centre; I think weak land might be trenched nearer than strong.

11th. The first and second hoeing is from 3 to 4 inches deep, so as to turn over a good sod.

12th. The rice generally turns yellow, and the growth is checked by taking off the water when in belly, but by giving the rice air at this time, I find it beneficial in speedily bringing the ear *fully* and *regularly* out; it is for this purpose and not merely to clean it of grass that I take off the water at this time.

13th. Answered above.

14th. The length of time intervening between the first and second hoeing, after the long flowing, depends altogether upon circumstances, and the state of the field, and if the second hoeing cannot be done *before* the appearing of the *second joint*, it is omitted and the water put on. The time intervening between taking off the water from the *long* flowing and returning it varies considerably, even from 15 to 28 days, according to the good or bad condition of the field and the weather, but to make a good and full crop, the rice

*must* be cleaned of *grass* and the water put on at the forming of the *second joint*.

15th. It is certainly preferable to hoe a field when perfectly dry. I generally hoe as soon as the field is dry after the water is off. I never hoe a field wet, except compelled by necessity; the grass cannot be killed when the field is hoed wet; when hoed dry it is all destroyed.

16th. I can express no opinion relative to Mr. C. E. Rowand's suggestion. My invariable practice, however, is to keep the water deep on the rice, frequently freshening it from the time it is in ear till it is fit to cut, *i. e.* we let off the water 4 or 5 days before we cut the rice.

17th. I consider it very important to keep the water on and deep when the rice is soft and in milk.

18th. I commence harvest when the rice is hard and full ripe within a few grains of the bottom of the ear.

19th. My trenching hoes are three inches wide, the weeding eight.

20th. If land is *well drained* and in *good order*, five acres of rice, and 1 or 1½ of provisions may easily be cultivated to the hand.

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ART. III.—*On the Culture of Cotton; by* THOS. PARKER.

"Calhoun Settlement, Abbeville District, 30th March, 1831.

*Dear Sir*,—In compliance with your request to "communicate my mode of cultivating my cotton crop," I now proceed to do so; not from any expectation that I can communicate any thing new, but from the belief, that if planters will, through your journal, give to their brethren the benefit of their experience, the Agriculture of the South would be greatly improved. I have certainly been instructed by it, and am willing to contribute my mite in return, however diffident I may feel in doing so.

The mode I pursue, in cultivating this crop, is that which, with but some trifling variations, is the course adopted throughout my neighbourhood. Having already informed you of the manner in which I prepare the ground

for and plant my crop, I will proceed to its cultivation. My corn and potatoes being always first planted are the first worked, and then my cotton. In doing this the first time, I ring round the cotton with the plough (either the Gofer or a small mould-board plough, if the latter, turning the bar to the cotton) as near as I can without throwing dirt to it, and plough the middles faithfully with a shovel or mould-board plough; so apportioning the hoes to the ploughs, that the latter shall be in advance of the former one day and no more. The hoes follow the ploughs—my directions to the workers being "chop through the drills, leaving the cotton in hills the width of the hoe apart—leave from three to four stalks in each hill, and haul up a little dirt to the plants." I have no fear of the cotton dying to any extent after this working; some may; but the advantage gained in causing the cotton when thus thinned out to grow off vigorously, I consider more than equivalent for the little loss sustained by the dying of a few stalks. There is no better way of putting a stop to the dying of the young cotton than to work it well. My cotton being worked over in this manner, I return to my corn and potatoes; after working which, I come back and give my cotton a second working. In doing this I plough the middles thoroughly, running very near to the cotton. At this stage it requires some judgment to determine whether the dirt should be thrown by the ploughs to the cotton or not. If the grass is too large to be effectually killed by smothering it with dirt and the dirt is thrown to it, the hoe hands, must push the dirt away with their hoes before they can get at the grass to cut it up, which puts it out of their power to work over as much ground or do it as well as they otherwise could. The hoes follows the ploughs, (the latter are one day ahead) my directions to the workers being "leave not a green thing in the field but the cotton—in no place let me see more than one stalk, and haul up a plenty of dirt to the cotton." Some of my neighbours leave two stalks in a hill; where there is a larger gap than usual between two hills; but I think this wrong, inasmuch as I believe that one stalk in such a situation will yield as much as the two, probably the staple of the cotton will be better, and certainly it can be easier picked out as the bolls will be larger. Having worked over my cotton in this manner the second time, I return to my corn and potatoes and work them the third time.

This done, I give my cotton its third working. The cotton being now sufficiently strong to bear a good moulding, I throw as much earth as I can to it with the ploughs, and also plough well the alleys. The hoes follow, uncovering any plants that the ploughs may have covered—cutting out the bunches of grass, and hauling up earth wherever required. At this working one of my neighbours, a successful planter, sends his hoes before his ploughs. I prefer, however, the other way. My potatoes are again attended to if they require it, and my corn generally, though not always the entire crop, worked over the fourth time; this depends on many circumstances. My cotton always receives a fourth working. At this time if the cotton has not branched out too much to permit it, I again plough it, but do not plough very near it nor very deep. The hoes chop out any bunches of grass which may have been left at the last working. With this working, my cotton is generally laid by; but if the season has heretofore been dry and the cotton not well branched, and frequent rains should now occur, much young grass will sprout up, and and a fifth ploughing, done *very shallow* and not near to the cotton, will be requisite; not so much to increase the production, as by destroying this young grass to facilitate the picking out of the cotton and picking it clean; for this grass if not destroyed, will attain a considerable growth. I task my hoe hands; in doing which, to do justice to yourself and the workers, requires that judgment which can be formed only from experience and careful observation. At the first working they generally do me three-fourths of an acre if cotton was not planted the last year in the same field; but if it was, they can generally hoe an acre. On the second hoeing, they generally do three-fourth of an acre, sometimes only half an acre. I plant six acres of cotton to the hand, which is about the usual quantity planted in my neighbourhood. I do not make as large cotton crops as some of my neighbours; I am content with three to three and a half bales of cotton to the hand with my provisions and pork; but some few make four bales, and last year, two of my neighbours made five to the hand. In such cases I have vanity enough, however, to attribute this to better lands. I have no overseer, nor indeed is there one in the neighbourhood; we personally attend to our planting interest, believing that as good a manure as any, if not

the best, we can apply to our fields, is the print of the master's footstep. One of my neighbours who is a judicious and successful planter uses alternately the plough or an iron toothed harrow in working his cotton. His land is a high, *loose*, rich mulatto soil, and not much troubled with grass; but as mine is of a closer texture, liable to bake and become hard, I have not even thought it advisable to try his plan. Where the harrow can be used for this purpose with success, fully half of the ploughman's labour is saved.

When I first commenced planting as a profession, I worked every part of my cotton crop in rotation, in the order in which it was planted; but experience has proved to me, that however systematic this plan may be, it is bad in practice. I now work such parts of my fields first, as require it most, without caring which was planted first or worked last. Experience has also taught me to "keep a bright look out ahead" for rainy weather, and if I discover the least appearance of it, I examine with care such parts of my fields as lie low, and if I think it necessary, work them over immediately; for although the grass may then be young and easily destroyed; yet if such parts of a field are caught the least out of order, by a warm, *leaking* spell of wet weather (as it is sometimes called) the grass will have made fearful progress by the time the ground is dry enough to be worked; and it will not only take twice the labour to put it in the order that it should be, but in doing so, the workers will destroy much of the young cotton after it has been thinned out, and this necessarily lessens the crop. A planter should *always* know the exact situation of *every part* of his crop, or he will sometimes be taken by *surprise;* and the only way to obtain this knowledge is, frequently to *go over* and examine his fields. If it is true that "the master's eye makes the horse fat," 'tis equally true that the print of the master's footsteps manures the field.

Yours, respectfully.

THOMAS PARKER.

ART. IV.—*On the Culture of Corn and Peas, in reply to "Q in a corner;" by* A PLANTER, *of the Lower Country.*

"February 22d, 1831.

*Sir,*—Your correspondent "Q in a corner," is rather facetious in his inquires as to making a sufficiency of provisions, and particularly of the sweet potatoe.

In the the first instance let him attend well to littering his cow-pen with marsh, rushes, corn-stalks, or pine-trash, the two former are preferable if they can be obtained, and also attend to cleaning out the cow-pen once a month or six weeks, and removing it into a close heap to remain and rot until wanted for use, and apply at the rate of 350 bushels or upwards to the acre of his root potatoes, and also his slips, and dig up his land properly either by the plough or hoe, having early vines and always slip-land prepared to embrace the first rains in the month of June, and I think he will seldom fail. The writer himself never plants more than from eleven to twelve acres of both roots and slips, three and a half of the former, and from seven to eight of the latter; he feeds from fifty to sixty slaves, besides horses, cows and poultry, and seldom less than eight months in year.

I have used the broad-casting of the manure both in my roots and slips; in the roots I think it suits well but not so in the slips, as I dig them with the plough and they branch out on the side of the bed in search of the manure, and are covered in the ploughing. I have for the last two years listed my slip-land and ploughed it between the list and planted the vines on the list without banking, and I think advantageously, particularly in land that is foul with nut or joint grass.

If you think the above observations in reply to Q's inquiries worth insertion, you can insert them.

A PLANTER, *of the Lower Country.*

ART. V.—*Observation on the Bonavista Bean and the Cow-pea; by* JOHN PORTEOUS.

"Beaufort, 9th March, 1831.

*Dear Sir,*—I have deferred the acknowledgement of my thanks to you for your kind present of the Bonavista beans, until I could give you some account of my success in their cultivation. On the 9th of April they were planted in my orange grove. In the course of 9 or 10 days they came up very generally, but were in a short time after so much infested by the worms, that not less, I am sure, than two-thirds were destroyed. Those which remained put out a great number of stems, and these produced abundantly. On the 26th June, several pods were picked and the beans were perfectly ripe. At this time there were on the stocks ripe and green pods and blossoms, this continued to be the case until the fall. On the 1st September, is this remark in my diary: "the Bonavista beans planted the 9th April, have now on them ripe and green beans and flowers. This is extratordinay as they have not been hoed for a long while and are very grassy." For the benefit of my orange trees I had the grove planted in cotton; the beans received the same culture as the cotton. On the 10th July, I planted in my pea-field a task of these beans, which were gathered from the orange grove. Notwithstanding the time of year and the seasonable rains when they were planted and for some days after, they were not up before the 24th. On the 1st September, I observed they were putting out blossoms. On the 13th October, I noted in my book, "that on the 11th, there was a severe hail storm which had injured these beans very much, and that they were also much injured by the worms, that at least one-half are destroyed." On the 31st, I made the following observations: "the greater part of the Bonavista beans are so backward that I do not calculate on getting seed from them. For the future I shall plant them about the middle of May, they will be less subject to the worm in the spring and will have a longer time to bear and mature their fruit than when planted in the summer. The worms continued their depredations until the severe cold weather. On the 21st December I had gathered in as many as I wished for myself and

to be given away. My opinion of this bean is very favourable. It is more productive than any kind of bean or pea which I have known, and I am satisfied if it could be preserved from the ravages of the worm, it would be well worth the attention of the farmer. The peas which were adjoining these beans, were not at all troubled by the worms.

Having understood from a friend in Charleston, that you were desirous of knowing the result of my experiments on the culture of the cow-pea, with a view to fodder, grain, and fallow crop, and being satisfied of its answering each of these objects, I take a pleasure in gratifying your wish, and in doing so I shall promote in some degree the cause of agriculture. I was induced to make the experiment as it regards the two last from reading in that most valuable and interesting work the American Farmer, a letter from Col. Thomas Pinckney, on pea-fodder. It occurred to me that the culture of the pea for that purpose was in the lower country susceptible of the additional benefits of grain.

I accordingly the day after I read his letter, viz. the 23d April, 1828, had two tasks planted. On the 4th August, the vines were cut and when they were well dried they weighed 600lbs. The earth was then hauled up to the stems which were about 6 inches in length. On the 6th and 7th October, 2 bushels and 20 quarts were picked, and on the 1st November, the remainder which had been gathered measured 2 bushels; in April, 1829, I had peas planted in the land which I intended for slip potatoes. The vines were listed in the alleys in the beginning of July, and good rich beds was formed. The potatoes were benefited by this process, but not as much as I expected, the land being high and the summer very dry. At the same time I planted the peas as preparatory to my potatoe crop, I planted three acres for fodder and grain. The vines were cut on the 4th August, and the product was 3900lbs. My overseer neglected to have the earth hauled up to the stems (it was hoed down directly after the vines were cut) and the consequence was the greater part of them perished. The last year I had peas planted for all of the purposes, but during my sickness by rheumatism they were so much neglected as to be of no account. Another quality of the pea which is not generally known, is that it will grow from

the cutting and produce well. It requires, however, at the time of planting a great deal of rain.

I am, dear Sir, yours, very respectfully.

JOHN PORTEOUS.

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ART. VI.—*On the Best Mode of applying Cotton Seed and Stable Manure; by* A PRACTICAL PLANTER.

"Near Mo. Vintage, P. O. Edgefield District, S. C. 23d, Feb. 1831.

*Mr. Editor*,—There is perhaps no subject in which there is so great a diversity of opinion as that of Agriculture, and it is a misfortune, that treatises on it, are so much at variance. This may in a great measure be attributed to theoretical speculations, and immatured practical experiments. One writer will state, that cotton seed as a manure is best applied in one way, another will give quite contrary advice, and both say they have succeeded, still there is an inquiry about the best mode of application. One planter will tell you, that the best way to clear, and prepare new land, is to grub the under-growth, and plough in the leaves. Another will cut down the under-growth, and burn off the leaves, considering the roots will act better as a manure than the leaves; still this remains unsettled as regards the utility.

One will pursue horizontal culture in a hilly country, another will advise it to be done diagonally, a third perseveres in the old plan of the up and down hill system; ask them all, and they will tell you their way is best. On the sea-board of the lower-country, where nature has provided an inexhaustible source of marine manure, which has been brought into sufficient use to test the best mode of preparation and application, the same difficulty appears to exist; that this should be the case, where there is such an abundance of labour, combined with wealth and science, is astonishing. Some excuse may be offered for the up-country planters, who require all their force to be applied to a specific object to gain a support, leaving them no supernumerary means to carry fully into effect, those experiments, that would otherwise ultimately benefit them.

I have been led to these remarks, from the productions in your volumes, as well as other periodicals on the same subject. The great object, it appears to me, is to arrive at a system of husbandry in the application of the means that is afforded us on the most economical plan. What benefit does agriculture derive from the exhibition of an extraordinary large potatoe or turnip, or a single acre of corn producing eighty or a hundred bushels, when the means applied for these productions cost more than their value. Let us exhibit the returns of a whole crop, and the mode adopted to give these returns, and not merely partial attempts to gain a reputation; this should be our guide:—by which the agricultural interest would be advanced, and instruction afforded to the planter; it will act as a stimulus to imitation, and will no doubt be attended with beneficial results.

As far as my experience goes, I would recommend the application of cotton seed as a manure to corn; after the vegetating quality is destroyed, to be put to the corn when from six to twelve inches high, according to the time that can be appropriated to this work, by digging with a hoe on each side of the corn, sufficiently deep to admit of a large handful or more to be put in each hole, and sufficiently covered over to prevent evaporation from the sun.

Fresh cotton seed should never be used, because the greater part will sprout, and the manuring quality will be destroyed, it is only the oil which this kind of manure possesses, that makes it so valuable, besides when it comes up in a great mass it opens the earth about the plant, so as to admit air which dries the earth about its roots. Fresh cotton seed can, however, be soon prepared for use. Have it carried out into the fields, and placed in piles at convenient distances, make these piles pretty large, and have the tops of them made concave, and through the centre drive a stake into the earth, and in the absence of rain have pails of water frequently thrown in, this moisture, with the sun acting on it, will in a short time heat the seed, if it is perceived, that the circumference of these piles do not become heated in time, open them and throw the outer part into the centre. I have applied it so hot to the corn, that it was difficult to handle it.

As we are now on the subject of manure, I would further observe, that in my view, the best mode of applying stable, cow-pen, or other manures, is broad cast, and immediately

to plough it in, but as we are not furnished with a sufficient quantity to do this to any extent, the drill mode is to be recommended; this should be done by making a furrow about a foot deep, in which scatter the manure and cover it over flush, the holes or furrows made for planting, will be above the manure, but the roots of the plant will soon reach it. The hoe is to be preferred in case a drill is made for planting, for the horses destroy the bed too much in the operation, the covering may be done with hand rakes, which leaves a smooth top on the beds, taking all the stalks and trash that may have been thrown on it by the plough, and will in some measure separate the seed without drawing them out, as it is passed lightly over the beds. We cannot expect that manure will act every year alike, all depends upon the seasons, it has been found, that stable manure particularly, in an extreme dry season, has proven injurious, from what is called fireing the corn, and in floods of rain it is said, that it has been carried beyond the reach of the plant in the bowels of the earth. Hence may have arisen the diversity of opinion as regards manuring, to which I have alluded from the want of that observation, which can only constitute the successful planter.

The fact is incontrovertible, that if it was not for manure, and good tillage, the European countries would long since have been depopulated.

A PRACTICAL PLANTER.

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ART. VII.—*On the Benefits arising from Horizontal Ploughing and Ditching; by* A HIGHLANDER.

"Georgia, February 24th, 1831.

*Mr. Editor*,—Most of your readers, no doubt, remember a discussion of the merits of horizontal ploughing, as a mean of preserving soil, conducted sometime last year by Mr. Simkins and Mr. Ellison. It interested me, and all others, I dare say, who have suffered the pain of seeing the rich hill sides of their plantations stripped by heavy rains of the soil to which alone the proprietor could look for the

production of crops. This evil is so general and so heavy in all the Southern States, that it may be regarded as *the plague* that is annually wasting the substance of the country, rapidly reducing the hilly parts of it to hopeless sterility and desolation. Without a remedy, I think there would be no risk in predicting that within the period of fifty years, four-fifths of this kind of surface will cease to be tenanted by the human race, though in its maiden fertility, this very region has been productive of better incomes than any other part of the United States. It is here, that thousands of planters, have in a few years raised themselves, by the fruits of the soil only, from poverty to independence, and many to affluence.

I am acquainted with no country where exhausted fields which lie level, are more speedily and cheeply restored to a good rate of production than the oak lands of South-Carolina and Georgia—and think it probable that the process is equally facile on the sandy plains of the "long leaf pine" country. But who has resolution enough to spread manure on a hill side from which the most or all will probably be swept by the heavy rains of a single season? None, who works for any thing but for the sake of work.

The question then presents itself, can the cultivators of the broken lands find relief against these devastations by the use of Mr. Simkins' prescription, horizontal ploughing, or any other practicable means? This mode of ploughing is not much practised in my neighbourhood, though in other parts of the State it has been for several years, and I believe very generally approved for the purpose under consideration. It is undervalued, I suspect, only by those who have never tried it, or who have been disappointed in extravagant and unreasonable expectations. No one who has ever seen such ploughing really executed, can affirm it to be useless, and the better opinion seems to be in its favour, admitting the fact that less ground can be ploughed a day, on this method, than the usual one of a straight furrows. Large fields, of which the surfaces are so inclined as to give a course of two, three or four hundred yards, (or even one hundred yards on any thing like a steep declivity) to running water cannot be so ploughed, with any instruments we are acquainted with, as to prevent the washing away of the surface and formation of gullies. In the space of a week, I think we sometimes have rain falling to the depth

of two or three feet, depositing a mass of water that mill-dams would hardly retain. No planter can wish to retain it, but rather to pass it off as quick as possible and with the least detriment to his soil, which cannot be so well done by any other means as *horizontal ditches* across his fields. By horizontal ploughing, the moderate and fertilizing showers of summer are retained for the benefit of the growing crop or pasture; and by horizontal ditches so located as to pass off to a neighbouring branch or ravine, the redundancy of water that falls at any season of the year, the soil on our hill sides may be made almost as safe and as durable, as that on the level plains. This is not speculation—several experiments are now making in this country which have thus far abundantly established the utility of combining the two, horizontal ploughing and ditching, and clearly shewn that the labour and expense of the latter is no impediment to its universal adoption. From the trial I have made, I suppose that half a dozen men, with spades, aided by a good horse and plough can make at least a quarter of a mile of such ditching a-day. Ploughing up the earth on the line marked out for the ditch, greatly facilitates the work, for it leaves the men with spades or shovels nothing to do but lift up the pulverized earth to the embankment on the lower side of the ditch, which need not be cut more than about one foot deep, and eighteen or twenty inches wide. The size, however, and the direction of every ditch cut for the purpose of protecting valuable fields from the destructive action of heavy rains, must be dictated by the experience and the discerning eye of the master or manager. They should not be perfectly horizontal, but have such an inclination as to give to the flowing water a gentle current; otherwise a rapid accumulation might break the embankment below, or without sufficient current to carry off the gradual deposits of sand, &c. the ditch would be filled up.

Should others of your subscribers have seen or made experiments on this subject, they could hardly fail to render essential service to our agriculture by communicating results.

HIGHLANDER.

## Art. VIII.—*Spirits of Turpentine—a Cure for the Staggers.*

13th May, 1831.

*Sir*,—I have thought that the enclosed paper on the treatment of a disease in dogs, hitherto incurable, might prove acceptable to some of your readers. Should you concur with me in opinion, you may make it public.

I am of opinion, that a faithful dog is one of the valuable servants owned by a planter; and that he owes many of his comforts to the skill, vigilance and fidelity of this animal. This faithful creature not only affords profit and amusement to his owner, by running the valuable as well as noxious animals in the vicinity off his farm, but guards by his vigilance from the midnight prowler, all the property which has been accumulated by the industry of his master. How imperative then does it become the duty of the farmer to cherish him; and when attacked by disease, to use his best exertions to preserve his life?

I have been led to these reflections by a fatal disease to which this animal is liable; and which has occasioned me to lose many a valuable one before I discovered the remedy. The disease I allude is the Staggers, and the remedy, the spirits of turpentine. With this medicine, I have lately succeeded a second time, in the course of a year, in curing a very valuable dog; and I have been informed that similar success has followed the use of it in the hands of one of my neighbours.

The disease appears to arise from weakness in the loins; and is most probably occasioned by worms. He has but little use of his hind legs—staggers about much—when down rises only on his fore legs, and finally loses all power to rise: at the same time, he has all his intelligence, and eats and drinks for a while as usual. I give a table spoonful of the turpentine, in as much or more molasses or brown sugar, three times a day, and seldom find it necessary to continue longer than the second day before the dog is restored to health. T.

# PART II.

## SELECTIONS.

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### ART. I.—*Essays on Agriculture; by* F. A. ISMAR.—*No.* 1.

[FROM THE AMERICAN FARMER.]

Agriculture is not only a noble, but the noblest profession on the face of the earth: every thing comes from the earth, and without its culture we must abandon the idea of any progress in politics and morals. There was a time when nobody thought himself so high as to despise agriculture; but when war and artificial needs had created idlers, a set of people who luxuriate on the labour of the active and industrious man; when the labouring class forgot, that in order to reduce to starvation the presumptuous fool who thought himself superior, that they have only to cease their work; then the producer received an idle master who despised the hands which fed and clothed him. Wherever that happened the labouring class must accuse themselves for having been satisfied when their stomachs were filled, and their bodies clothed, not thinking to instruct themselves so as to oppose the encroachers, not only by material force, but also by intellectual powers. The vile *flatterers* of the people are always their enemies, and will impose upon them a far heavier yoke, as they were obliged to humiliate themselves more in order to make the people slumber over their rights and interests. In this free country, I hope, not only all men are equal, but also inclined to gain such useful knowledge as to prevent such sycophants as I described, to suffocate their good sense and liberty by a bombastically oritorical stream. Here I hope every man is convinced of the truth, that it is not enough for a people to have the name and an *apparent* exercise of sovereignty, but that they must be *true* and righteous sovereigns. A man who knows the plough of the field, and the utensils of the workshop, only from description and drawings, is a bad legislator for the man who uses them with his hands. But let me not have the appearance of politizing. I wish to say something about the field and its culture, and shall merely by digression, speak now and then a word of politics, (not *party* politics,) as far as it may generally concern the people of field and workshop. I think it not necessary to say any thing about the different species of soil, and can substitute these introductory

words to the first part of my essays. I shall begin to speak of that mixture of remains and putrefactions of the animal and vegetable reign, from which an artificial vegetative earth is formed, I mean the dung or manure; a thing I think much neglected in this country. The manure is almost a corroborans of the exterior crumb of the earth, and a principal object of agronomy; it is the vital principal of husbandry; for it increases and betters the vegetative earth; and gives new force to the soil exhausted by the plants. It is therefore called upon to empower and enliven the grounnd. There are *dung materials* and *means of dunging.* The former are either *dry* or *liquid*, or *green dung materials.* In the first class we admit, 1. The excrements of all animals, also of man. 2. The destruction of their bodies and bones. 3. The obnoxious remains of butcher houses. 4. The remains of workshops, fabrics, manufactories. 5. The oil and oil cakes. 6. Dead plants of the earth, and the water. 7. Remains of walls. 8. Dirt of the streets. 9. Stuff of Malt. 10. Remains of tanneries. 11. Rust, &c. In the second class we place the the urine of beasts and men. 2. The slobber of the kitchen, the meat-banks, wash-houses, breweries, workshops, fabrics, and manufactories. 3. The water of flax and linseed, dairy, &c. In the third class we reckon all plants, i. e. peas, beans, clover, corn, wheat, rye, turnips, and other succulent plants, ploughed under in the full growth of vegetation.

The dung-means are not properly to be called manure, but only means to resolve, excite and dissolve the bodies. They belong also neither to the animal or plant reign, but from that of the minerals, i. e. lime, plaster, chalk, salt, and salt-ashes, saltpetre, and its ash, ash of wood, potass, and ash of charcoal, bricks. Farther, some things of a mixed nature must here be enumerated, as being partly taken among the materials, partly among the means of manure, i. e. compost, other artificial means of manuring and watering.*

But the dung materials of the first class as the excrements, &c. are neither at first manure, but only dung; and become only manure after having gone through a kind of putrefaction, or (to be more true,) of fermentation; i. e. when by the effects of warmth and humidity, the organic bodies (belonging to the animal and vegetable reign) destroy themselves, by which such a process is effectuated. This process of fermentation has three stages.—

* I have had occasion to observe in several countries the advantageous use of lime, particularly such as made from oyster shells, but I think it right to declare that I *never* saw this excellent manure better and cheaper prepared than in Bristol, Pennsylvania, by Messrs. ———.

They wish only that the farmer may make a fair *trial*, and I feel obliged to express not only my belief, but my conviction produced by observation and experience, that never will the farmer obtain a more effectual and cheaper manure. These gentlemen sell the bushel at 12½ cents, and pulverized at 18¾ cents.

1. The *beginning of putrefaction.* In this stage the warmth or heat is the greatest, for the greatest part of volatile salt is unfolded and recognized by the penetrant urine smell. The second degree produces the *destruction:* the heat decreases gradually, the straw and other plants become brittle; in the mass are produced salts, all become drier and brighter. The third stage is the *burning.* It begins by continued destruction, so that the vegetables or plants lose their organic texture, the anterior bodies reduce themselves almost to ashes, and the whole matter becomes a dry black earth, a pulverized vegetative earth. It is evident that the second stage is the best for use in agriculture.

It is evident that the second degree is the best for the use in the field. We have therefore to examine, how this process is to be produced in order to obtain that second degree.

The first requisite is an orderly dung-hill. This must be so arranged as to aid the necessary co-operation of warmth and humidity. Six things must be observed in this respect: 1. An equal distribution of the dung, i. e. it must be well mingled on the dung-hill, i. e. the various kinds of dungs, of horses, cows, hogs, or privies, and must be well and orderly intermingled and accumulated, in order that the superfices be not decomposed, and in the interior be prevented from becoming mouldy. After the mingling, the accumulation and firm trampling of the dung are an important requisite. 2. A moderate humidity; for too much of it hinders the fermentation, and too little exposes the dung to being too much dried and exhausted by the heat of the sun. 3. An equal access of the air, without which the dung becomes mouldy. 4. A moderate and equal warmth. Cold, as well as too much heat, hinders the regular fermentation; and by too much heat in particular, the richest materials are generally volatilized or lost. 5 Rest. A continual motion increases the exchange of air, and allows no interior warmth. Let the dunghill be continually trampled upon by cattle, picked open by poultry, or turned by hogs; it cannot putrefy in an homogeneous mass. 6. Large dunghills; for small and negligently dispersed hills are soon penetrated by heat and cold, become soon dry and decomposed in place of putrefying regularly. Large hills suffer comparatively less by the change of temperature, and their putrefaction is more regular.

A dung-place should be made like the hole of a privy, i. e. it should be water-tight, therefore entirely lined with clay. For that purpose no wall is necessary, and the whole arrangement is neither difficult nor expensive. Its site should be to the north, its form that of a rectangle, and its depth not more than three feet in the earth. The dung must furthermore, not rest immediately on the ground; but on a wooden grate, in order to give a way for emptying the ley, which by means of a gutter enters into a ley reservoir. In several parts of Holland, also at Mr.

Fellenberg's, at Hofwyl, there is in the midst of the dung-place, a pump, to take away the ley. Here now the dung is successively accumulated. The whole dunghill should not be higher than six, seven, at highest eight feet above the level of the ground. Each strata, equally distributed with the fork is to be trampled upon with the feet or with a roller. Over the dung-place a light roof of loosely united straw is to be built, so as to avert the heat of the sun and heavy rains, but to give access to air and humidity. Towards the south and the west, that roof must so much exceed the dunghill as to avert entirely the rays of the sun. It is also advantageous to plant trees around, at least brambles, along the walls, and to place some boards on the top. Finally, there must be gutters two feet wide, four or five inches deep around the place, in order to receive the rain water.

In order to facilitate the transportation of dung out of the stable, (generally wanted in this country to the great injury of the field, and the health of the animals,) there should be a door in the wall towards the dunghill, through which the dung can be taken It is useful to have more than one dunghill in a large husbandry, for they present the advantage to have partly separated the dung of horses, sheep, cows, &c.; by this means we are enabled to give to each soil, and to each plantation, that dung which is particularly wanting. But it should be an essential condition for every dung-place to have communication by the lower gutters with the reservoir of ley. Often, but principally during the summer, the dunghill must be basted with ley out of the reservoir, or wash ley, slobber of the kitchen, and in extremities with water. In order to accelerate fermentation, and to terminate it in four or five weeks, (generally it takes six or seven, often eight weeks,) the dunghill must receive a little salty things, i. e. vitriolic acid, crem. tartar, sal. glauberi, epsom salts, or plaster. Lime-water, (100 lbs. water in which some ounces of lime-stone, made ardent in a charcoal fire, and thus thrown into the water, with which it is immediately sprinkled) has the quickest effect. The human urine is also well calculated for that object.

In some parts of Holland and Germany, the dung is fermented within the stable, in preserving the dung dry by continual addition of straw, and allowing the cattle, hogs, and horses, to stay several days during the summer, and several weeks during the winter on it. An active care prevents the loss of any excrements; the whole mass is perfectly united by the animals lying, trampling, and perspiring upon; the urine is entirely absorbed by the straw; the equal warmth of the stables preserves an equal putrefaction, and the dung is sooner ripe. But this mode is injurious to the cleanliness, and therefore health of the animals. The similar dung-stables, (if I dare call them so) in this country, being in the open air, without walls or roof are only calculated to produce all disadvantages of that method in the

fullest extent, without presenting *any one* of its advantages. In the next number I shall speak more in detail about the dung materials and their preparations, after the three above indicated classes.

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## Art. II.—*Upon the Advantages of Shallow Sowing; by Mr. Freiherrn von Voght, of Flotbek.*

[TRANSLATED FROM THE GERMAN FOR THE FARMER'S MAGAZINE.]

In 1824 I had read for the first time, in Burger's Agriculturist's Instruction Book, published at Vienna in 1823, (the best instruction book that I know of in any language,) vol. i. page 282, of the experiments which Burger and Messrs. Pretri and Ugazzi had made as to the proper depth at which seed-corn must be put in the ground, in order both to ensure its shooting forth and producing the greatest quantity of ears. The result of all the trials has been, that the seed sown one inch deep grew the fastest and brought most ears. I remarked also, that not only in the peasants' fields, but also in mine, the corn always sprang up unequally, and this not only as regarded the length or shortness of the time in which it became visible, but also with respect to the strength and fulness of the plant. Hitherto I had ascribed this to inequality in the germinating power of the seeds, since seeds sown close together, and under precisely the same circumstances, had brought forth very weak and very powerful plants. I thought also that some disease had hindered the corn in its unfolding, or that it might have suffered from worms. Turning my attention to the point in consequence of what Burger said about it, I took up out of many fields plants of the rye and barley which showed this difference, and found, almost without exception, that all the strongly growing plants were coverad with very little earth, and that the seeds of all the weak plants were from one and a half to three inches from the surface. Each had shot out many little roots, and at the same time with the opening of the seed-leaves the coronal *knot* had formed itself immediately above the soil; roots and small shoots richly and strongly, and quite contemporaneously, and in nearly like proportion, sprouted out; even on the same side where a *crown* (main?) root penetrated into the earth, arose a new shoot. The broad fresh leaves promised to afford much nourishment to the plants from the atmosphere, and thereby to occasion a vigorous growth. How was it with regard to the more deeply sown seed? The little roots were few in number, and weakly; from the seed a small whitish pipe, from one to two inches in length, had sprung to the surface: the

coronal *knot* formed itself on the surface, but with only a few meagre leaves, and one solitary ear alone expanded thereon.

The thriving, leafy and strong growth of the plant forms the seeds remaining nigh the surface, was as striking as the wretched appearance of the roots, leaves and stalks of those from the deeper lying seeds. Both appearing to me to afford such a convincing argument in favour of the great advantages derived from slightly covering the seed, I sketched some specimens of both sorts of the rye and barley, and showed them to my friends. I observed several other plants differing in this manner during their progressive growth, and found that the weak plants produced but one sickly ear; whilst the strong ones had borne from three to six stalks, and full of ears. My attention being thus excited, I made for many years several trials on a small scale, in places where I could more accurately settle the situations of the seeds. Not one experiment proved unfavourable to the shallow sowing. I particularly took for the purpose, summer-wheat, barley and oats, since, for reasons hereafter mentioned, the exposed state of a certain number of seeds (inevitable from the shallow underploughing of the seed) certainly causes the loss of some in the spring. My observations were as follows: 1st. That the plants laid three inches deep in the loose soil, after a few weeks scarcely lay two inches deep, which is to be attributed to the sinking of the land, whose great density must also render it more difficult for the little white pipes to penetrate. 2dly. The plants from the deeper lying seeds became visible in about eight or ten days later. The disadvantage of this tardy appearance is well known to every husbandman. 3dly. The seed-corn appeared in both cases, after twenty or one-and-twenty days, entirely hollow and decayed, but it took fast hold in the spot of germination with its roots; the plants also which came later to the surface were wholly without that nourishment which those near the surface received through their fresh seed-leaves *(cotyledones.)* 4thly. The whitish sheath, forming a tolerably hard skin, growing from the deeper lying corn, is defended by a small white pipe, which goes to the surface; as soon as it come to the light, some leaves and a *knot* are produced. This sheath and the deep lying small roots decay, and roots shoot forth afterwards from the *knot.* 5thly. There is a joint in the knots of the seeds lying nigh the surface, or rather the joint and the first *knot* are one. Hence shoot forth very quickly small roots of the thickness of a hair, which I have seen penetrate the clay with much force from two to three inches. In September, 1827, I caused all the rye-seed to be put very shallowly underneath the soil. After about three weeks, the plants which had been covered with half an inch of earth had already *branched.* The seeds which I had purposely laid on the surface without covering them, germinated ten days later, and put forth a leaf; whilst the slight-

ly covered ones had already a small handful of leaves, rising from a powerful mass of little roots, which were full two inches long: a wonderful provision of nature, which makes the plant thus fix itself more carefully in the soil, where its situation near the surface renders it necessary. I took especial notice of one entire ear which lay on the surface; it had put forth strong roots from each seed into the earth, and a powerful leaf above. I was never more convinced that one does not lose much by sowing in nature's fashion. From 1826, I had been considering in what manner to sow near the surface and yet to leave the seed somewhat covered. Small experiments had satisfied me that nothing would be gained by it if the surface were not pulverized, so as to allow the first little roots to penetrate easily and the young plants to fasten in the soil, which afterwards imbibe through their leaves nourishment for the later *crown* roots. I had already long ago remarked, and always with renewed vexation, that according to the old mode of sowing, the corn was not only at very unequal depths in the ground, but also very unequally distributed on the land. If it was sown in a field that had been harrowed, the seed fell into the furrows made by the harrow, whose teeth stand seven inches apart. The cross harrowing does not properly spread the seed; the rows remain visible, the seeds are too close together in them, and few plants are in the six-inched space between the harrow tracks, a good deal of land is wasted, and an opening given to weeds. It is much worse when the seed falls in the furrows. This mode possesses also all the faults possible for any way of sowing to have, the seeds being unequally distributed and different in depth. The Flemish harrow, whose teeth stand eight inches asunder, drawn diagonally by one horse, makes only a stroke of four inches. Mr. Coke's sowing machine, which is used throughout England, makes lines nine inches apart, and brings too many seeds into one line; but it possesses the advantage of sowing the seed throughout at the same depth and as shallowly as you choose. Of late years I have never harrowed where I have sown with this machine.

The arable land of Flanders, as well as mine, is too *fine* and clean *to* profit by *drilling*; all obtained thereby is an equal division of the seed, and the getting it near the surface. I found this was only practicable by employing a finer harrow, which the slack condition of the fine particles permitted to be used. In 1826, I had made some small iron and wooden harrows, whose teeth stood three inches and a half asunder. These I had, before sowing, dragged over the already finely harrowed land. I harrowed in with this, and with the Flemish *schlepp-zinne* harrow. I gained greatly in the equal coming up of the seed, in the number of *branched* plants, and their equal condition. For the sake of comparative experiment I had always

managed a few fields in the old way. In 1827, I had a Flemish harrow made, with teeth three inches apart. It requires two horses, but its operation is very great. In 1828, I provided against the fault noticed in it, (that it shoved forward even in finely harrowed land,) by dragging it over the field, *with the horse attached to the centre*, after I had harrowed the land finely with the old Flemish harrow. By means of the wavy lines which it makes, all small clods become loosened. Then I have the field dragged over with a strong harrow reversed, which, in case of need, I loaded; and I afterwards draw sharply over it the Flemish garden-harrow, with the horse yoked cornerwise. Thence comes lines an inch and a half from one another. At this distance falls the seed, and then I have it crossed either with the old or the new Flemish drag--the first, when I fear that the harrow may shove the soil forwards. No garden-harrow can make the soil so fine. The plants thus sown stand from one and a half to two inches from each other, covered over in the earth to the depth of an inch, strong and healthy, as if they had been planted. I can appeal to the testimony of all agriculturists who have in former years visited Flotbeck, or of those who are willing to honour it this year. The fields which in 1826 and 1827 I had harrowed in as shallowly as possible, gave a result conformable to the improvement of the harrowing. In 1828, after sowing with the garden-harrow and harrowing with the Flemish drag, I had 17 per cent. more corn, and 14 or 15 per cent. more straw, in the light clay land of Little Flotbeck, than in the fields sown after the old method; in Great Flotbeck, than in the fields sown after the old method; in Great Flotbeck, in the best sandy soil, 20 per cent. more corn, no difference in straw; in the worst sandy soil, 10 per cent. more corn, in straw no difference. That, however, which I last autumn, for experiment, have sown or got under after the grub-furrow or the coarser kind of harrow, stands, notwithstanding the careful harrowing in with the usual harrow *unequally, crowded in lines*, and less strong, than that sown after the Flemish garden-harrow, and dragged in with the common Flemish drag.

*(To be continued.)*

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## Art. III.—*Gama Grass.*

[FROM THE MOBILE COMMERCIAL REGISTER.]

*Mr. Editor*,—Some years ago, say four or five, I read in the Washington City, and some other public Gazettes, an account of the singularly valuable properties of a Grass, found in the

south-west, and principally through the provinces of South-America, called by the Spaniards the "*Gama Grass.*" I think some time ago a communication appeared in your Register on the subject of this grass, or an extract from the communication of some Spanish gentlemen. On reading in the Washington City papers, however, a communication from a distinguished citizen of Maryland to the Agricultural Society, I determined to procure, if possible, the seed of it, and to ascertain whether or not it would be found to exhibit in Alabama, and its *climate* and *soil*, the same valuable qualities.

From the communication before mentioned, a *Doctor Hardeman*, of Missouri, was stated as the gentleman to whom the country was indebted for bringing into notice and usefulness, this valuable vegetable acquisition. The Doctor was not unknown to me as one of those few minds who can blend together a fair and manly pursuit after the good things of this life, with that happy degree of philanthrophy which cannot be satisfied without adding something to the *general stock* of human comfort and happiness—and the antipode of those who can wrap themselves up in the slazy web of *self*, and contemplate every thing through that (to them) *delightful* medium. I learned that his *patriotism* was equalled by his *liberality*, and I wrote him my desire to *give to this section of the Union* the advantages, if possible, attributed to this valuable plant. On the receipt of my letter, he immediately forwarded me, by mail, the remaining few seeds he had left, and which on receiving, I quickly planted, and I now view it as a remaining duty to the public, to put them in possession of the result, which fixes in my opinion the character of this plant, *to this section of the Union* as almost *invaluable.* To the citizens of your *town* and *vicinity*, I am assured its value can hardly be calculated.

On receiving the seed, say in *March*, early, I planted them in a small bed, by drilling, placing the seed about six inches apart. They came up in a few days, and appeared in the form of young *oats.* On getting about six inches high, I took them up after a rain, and set them, agreeably to the Doctor's directions, in rows, *two feet* apart, and *eighteen* inches from plant to plant, in *sandy pine land slightly manured.* The *rapidity of their growth* astonished me, and I found by *September*—each plant *a bunch of fine blades*, and the ground completely covered, and the spaces filled up—the grass *three and a half to four feet high.* I kept the ground loose and clean, between the plants. Early in September it was cut, and in taste, resembled young *corn* blades—a taste, of all others, most agreeable to animals. I found every thing was prodigiously fond of it, especially *horses* and *cattle*, and that it was a *dry grass*, with little *succulence.*

The following spring, *early*, the ground was stirred between the plants, the roots of which were now about four inches in diameter, resembling the root of sugar-cane. A small quantity of manure (cow) was sprinkled over the ground, in December following, and by the *first day of May* it was *four* feet in *height*, a mass of blades, rising from the roots, and standing almost perpendicular, exhibiting a most beautiful appearance of vegetable luxuriance. It was cut on the *first day of the month*, and *regularly* on the *first day of every* month until November; ranging from *three and a half to four and a half feet in height.* Single roots produced from twelve to thirteen and a half pounds of grass at a *cutting*, and which when fully cured produced from five to five and a half pounds of the most highly flavoured hay I have ever found, and *readily* cured. The last year gave a most decisive proof that it is hardly affected by *drought*, its production being equal to the previous year, and the last winter, that our severest cold does not affect the roots, now about *six inches diameter*, penetrating the earth, perpendicularly to a great depth.

A most accurate *cutting* and *weighing* has determined, that an *acre* will yield (of pine land manured) from *two hundred to two hundred and fifty thousand* pounds of green grass during the summer, or from *seventy-five to ninety tons of hay*, and of the most *nutritious* kinds known upon the earth. By a reference to the Washington City papers two or three years back, it will be seen that a distinguished *farmer and iron-master*, states, in a public communication on the subject of this grass, that he found on trial, such was its nutritive qualities, that his *mules* performed their work *well*, with plenty of this *grass* and *salt*, rendering the addition of *corn* unnecessary. I discover that it comes to *maturity* one year sooner in this section of the Union than in *Maryland* or *Missouri*. The second year I found a *few seed* stalks, and the third, say *last year*, I gathered the seed, a part of which I send you for distribution amongst some of your enterprising citizens, who will not forget to "*go and do likewise.*" In the communication before referred to, it will be found the estimation was, that "*one acre was fully competent* to the support of *twenty head of cattle during the summer.*" That it would be admirable for the production of *milk* and *butter*, there cannot remain a doubt, and that a little attention to its cultivation would preclude the necessity of purchasing *northern* hay, is as plain, as that it would add to the comfort and general prosperity of the whole community. Amongst the citizens of many of the *South American States*, it is held in estimation equal to the *Guinea* grass of the West-Indies, but is certainly far superior in value. The duration of the roots I have not learned, mine are putting out most vigorously this *fourth year*—a singularly valuable property, different from most other grasses is, that when the seed is ripening on the end of the seed stalks, six to eight feet high, the mass

of leaves appears not to undergo any change, and it may be cut immediately after the seed is all gathered, say by the middle of June. The seed is formed, making a jointed appearance at the end of the seed stalk, ripening and falling off one seed at a time. They must be watched and gathered daily, as different birds appear to watch for them.

Should the cultivation and possession of this plant prove a source of additional wealth, and add to the welfare of the citizens of your vicinity, I shall congratulate myself for my own good fortune in being instrumental in producing so desirable a circumstance. I shall forward an additional parcel of seed this summer.

Respectfully, your obedient servant,

AGRICOLA.

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## Art. IV.—*On Changing Seeds.*

[FROM THE GENESEE FARMER.]

We do not know of a more common error, than the practice of changing seeds, when farmers do not wish to change variety, or of changing animals, when the breed is the same, believing that the transferring of seeds or stock often, from one farm to another, is of importance to the growth of individuals of the animal or vegetable kingdom. When we hear farmers say "I have had my corn or my potatoes so long that they are *run out*," or that "their flocks have been so long upon their farms that they are much degenerated," then we think they are proclaiming their own disgrace, and are virtually saying that they are not fit to superintend their own flocks; that they neglect them so that they ruin them; that they are too lazy to gather their seed corn as they ought, and wish others to do it for them. To such men we think the proverb of Solomon will apply; "Yet a little sleep, a little slumber, a little folding of the hands to sleep, so shall thy poverty come as one that travaileth, and thy wan as an armed man." The fact has been long established, that by a course of breeding denominated "in and in;" that is, by breeding from the best animals, and rejecting the poorest, a flock may be greatly improved, and in this manner, some of the finest breeds of England have been produced,—the same rule will apply to corn. Now if by careful attention to the rules of breeding from the best stock, a progresive improvement is made, and this improvement is denominated breeding "in and in," then when farmers sell off their best stock and breed from the poorest, the course with the same propriety, may be called breeding *out and out.*

Yet so it is, the butcher wishes to purchase some fat sheep, (and the best sheep are the most disposed to fatten) and the farmet allows him to go and select from his flock such as he chooses leaving the refuse for him to breed from, upon the *out and out* system. His fields of corn ripen and are gathered, the best sold and from the poorest selects his seed, some of which fails, but it is all said to be owing to having been on the farm so long. His potatoes are dug up and put in the cellar, the largest are picked up by the boys to feed to the pigs; the women look for the largest and best kinds to boil, and by planting time none remain but the refuse of the crop; these are planted, and because they do not produce a fine crop, as to kind and quantity, it is said they are *run out*, and the term is very proper, since they were raised upon the true *out and out* system. If the farmers will select such of their sheep at shearing time, as they find do not produce good wool, are getting old, or have other bad points about them, and put them by themselves for sale, and reserve those of good points only to breed from, they will soon find the advantage of the "in and in" system. So with the potatoes, let the choicest be selected for seed, keeping the several kinds separate: let these be planted in good soil and well tended, and we venture to say that the second crop will convince the man that his potatoes are not *run out*.

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## Art. V.—*Spayed Cows.*

[FROM THE NEW-ENGLAND FARMER.]

*Mr. Fessenden*,—Some years since I passed a summer at Natchez and put up at a hotel then kept by Mr. Thomas Winn.—During the time that I was there, I noticed two remarkably fine cows, which were kept constantly in the stable, the servant who had charge of the horses, feeding them regularly, three times a day, with *green Guinea grass*, cut with a sickle.

These cows had so often attracted my attention, on account of the great beauty of their form and deep red colour, the large size of their bags and the high condition in which they were kept, that I was at length induced to ask Mr. Winn, to what breed of cattle they belonged, and his reasons for keeping them constantly in the stable, in preference to allowing them to run in the pasture, where they could enjoy the benefit of air and exercise, and at the same time crop their own food and thereby save the labour and trouble of feeding them? Mr. Winn in reply to these inquiries, stated, that the two cows which I so much admired, were of the common stock of the

country, and he believed of *Spanish origin*—but that they were *both spayed cows* and that they had given milk, either two or three years.--Considering this a phenomenon (if not in nature at least in art,) I made further inquiries of Mr. Winn, who politely entered into a very interesting detail, communicating facts, which were as extraordinary, as they were novel to me, and supposing that they will prove equally as interesting to your numerous agricultural readers, as they were to me, I am induced, on the request of a friend, to offer them for publication in your very valuable journal, in the hope, that some of the farmers who supply our large towns with milk, will deem them of sufficient importance, to make experiments for the purpose of ascertaining whether the results which they may obtain, will corroborate the facts stated by Mr. Winn, and which, should they be fully confirmed, may lead to great and important benefits, not only to farmers, but to tavern keepers and other inhabitants of cities, and villages who now keep cows, in order that they may be sure of a constant supply of *pure* and *unadulterated* milk.

Mr. Winn, by way of preface, observed, that he had in former years been in the habit of reading the English Magazines which contained accounts of the ploughing matches which were annually held in some of the southern counties of England, performed by cattle, and that he had noticed that the prizes were generally adjudged to the ploughmen, who worked with *spayed heifers*—and although there was no connexion between that subject and the facts which he should state, it was nevertheless the cause which first directed his mind into that train of thought and reasoning, which finally induced him to make the experiments which resulted in the *discovery* of the facts which he detailed, and which I will narrate as accurately as my memory will enable me to do it, after the lapse of more than twenty years.

Mr. Winn's frequent reflections, had (he said) led him to the belief—"*that if cows were* SPAYED *soon after calving and while in a full flow of milk, they would continue to give milk for many years, without intermission or any diminution of quantity, except what would be caused by a change from green to dry or less succulent food.*"

To test this *hypothesis*, Mr. Winn caused a very good cow then in full milk, to be *spayed;* the operation was performed about one month after the cow had produced her *third* calf; it was not attended with any severe pain or much or long continued fever; the cow was apparently well in a few days and very soon yielded her usual quantity of milk and continued to give milk freely, for several years, without any intermission, or diminution in quantity, except when the feed was scarce and dry—but a full flow of milk, always returned, upon the return of a full supply of *green food.*—This cow ran in the Mississippi low grounds or swamp, near to Natchez, got cast in deep mire and was found dead.—Upon her

death, Mr. Winn caused a *second* cow to be *spayed*, the operation was entirely successful, the cow gave milk constantly for several years—but in jumping a fence, stuck a stake in her bag, that inflicted a severe wound, which obliged Mr. Winn to kill her. Upon this *second loss*, Mr Winn had two other cows *spayed*, and to prevent the recurrence of injuries from similar causes with those which had occasioned him the loss of the two *first spayed* cows, he resolved to keep them always in the stable or some safe enclosure and to supply them regularly with *green food*, which that climate, throughout the greater part, if not all the year, enabled him to procure.

The result in regard to the two last spayed cows, was, as in the case of the two first, entirely satisfactory, and fully established, as Mr. Winn believed, the fact, that the *spaying* of cows, *while* in full milk, will cause them to continue to give milk during the residue of their lives, or until prevented by old age.

When I saw the two last spayed cows, it was I believe, during the third year that they had constantly given milk, after they were spayed.

The character of Mr. Winn, (now deceased) was highly respectable, and the most entire confidence could be reposed in the fidelity of his statements, and as regarded the facts which he communicated in relation to the several cows which he had spayed, numerous persons with whom I became acquainted, fully confirmed his statements.

At the time to which I alluded, I endeavored to persuade Mr. Winn, to communicate the foregoing facts to the late Judge Peters, then President of the Agricultural Society of Pennsylvania. But he was restrained from complying with my request by an extreme unwillingness to appear before the public, and *peradventure*, his *discovery* might prove not to be new, as doubts in regard to the facts, might *where he was unknown*, subject him to some degree of ridicule.

The many and great advantages that would result to the community, from the possession of a stock of cows, that would be *constant milkers*, are too obvious, to require an enumeration.

Should gentlemen be induced from this communication, to make experiments, they will find it better to spay cows which have had several calves, rather than heifers, as at that age, their bags are usually large and well formed, and are capable of carrying a much greater quantity of milk (without pain and inconvenience,) than younger animals.

VIATOR.

## Art. VI.—*On Horticulture; by* Jesse Buel, *of Albany.*

To the President of the Monroe Horticultural Society.

*Sir*,—In return for the flattering compliment conferred upon me by the Monroe Horticultural Society, I beg leave to offer to the consideration of its members a few remarks upon some of the modern improvements in horticulture, in the hope, that although the amateur may find in them nothing new or valuable, yet that they may afford some interest to the noviciate in the delightful business which you have associated to promote.

The production of new and valuable varieties of fruit, by artificial means, may be classed among the great horticultural improvements of the day. The analogy between animals and vegetables, in perpetuating their species, by sexual organs, has been long known. Defects and diseases, as well as habit, are often hereditary in both, and the opinion seems to have become pretty general, that the variety in the vegetable, and the breed in the animal, if kept long distinct and unmixed will gradually deteriorate and finally run out. Mr. Jefferson was of opinion, that the royal blood of Europe had degenerated into imbecility by exclusive intermarriage among its members. Mr. Knight, the enlightened President of the Horticultural Society of London, and other eminent pomologists, embraced the opinion, that vegetables have the same tendency to degenerate without the admixture, in the process of fecundation, of different species and varieties. The disappearance of old varieties of the apple, and the diseased state, and increasing barrenness of other varieties, yet under cultivation, seemed to confirm this opinion, while the potatoe, and other productions of the farm and garden, offer to our observation a farther proof of its correctness. So strongly did Mr. Knight become fixed in this opinion, by a series of experiments, conducted for years, with great care, that he seriously advises orchardists never to plant an inoculated or grafted apple tree, unless the parent tree is known to exist in a healthy state.

During the last five and thirty years, many distinguished horticulturists of Europe have devoted particular attention to this branch of phisiology; and they have been successful, not only in making up for the extinct varieties, but in greatly multiplying the number and varieties of our fine table fruits. Two methods have been pursued, and both successfully. The one by crossing (to use a breeder's term) two distinct and approved varieties. The other may be called the Bakewell plan, of breeding exclusively from the best individuals. T. A. Knight took the lead in the first; and Dr. Van Mons, of the university of Louvain, was the poineer in the latter.

Mr. Knight began his experiments near the close of the last century, upon the garden pea. He found to his great delight,

that the progeny partook of the character of the two parents, and that it was more vigorous and prolific, on being planted, than either of them. He next extended his experiments to the strawberry and the apple, and subsequently to the cherry, peach, and other fruits. Knight's peas are well known and sought for by our gardeners, as being abundant bearers, and excellent for the table. The Downton strawberry, which has grown in my garden to the size of four inches and three quarters in circumference, is the cross of two American varieties. His Black Eagle, Elton, and Waterloo cherries, are already in high estimation. His Downton pippin equals one of its parents, the old golden pippin, which was long the pride and boast of an Englishman's table: his red and yellow Ingestrie fall but little below it in the scale of choice dessert fruit; while his Foxley, Siberian Harvey, yellow Siberian, Grange and Downton, exceed in the specific gravity of their must, or fresh expressed juice (the best test of a good cider apple) the celebrated Stire. These fruits are all growing in my grounds, and exhibit a healthiness and vigour, unusual in old varieties.

The process of Mr. Knight consists in destroying the male organs (stamens) of so many flowers as he designs for experiment, before the blossom open: in fecundating or impregnating the female organs, (pistils) when the flowers are fully expanded, with the pollen of the variety selected for the cross; and in carefully excluding insects, which might introduce the pollen of other varieties to the denuded pistils, and thus defeat the object of the experiment.

In making his experiments with the apple, Mr. Knight, in several instances, availed himself of the character of the Siberian crab for hardiness, and as a great and annual bearer, and chose it as a subject for experiment. The trees which originated in this cross bear a strong resemblance to their northern parent.

Dr. Van Mons and his Flemish contemporaries, commenced their experiments simultaneously with Mr. Knight. They preferred to begin with the seeds of wildlings as being most hardy, and most exempt from hereditary disease. It had been the practice, in selecting from seedlings of two or three years growth, with a view of obtaining new varieties, such as had few or no spines, large leaves and thick shoots. But Dr. Van Mons found such plants, particularly pear seedlings, to produce generally summer fruits of a small size and little flavour. He therefore chose thorny plants in which the spines were long, and furnished with buds to their summit, and of which the general aspect of the plant recalled to mind some good known variety. When these plants bore fruit, he sowed their seeds and again the seeds so produced to the fourth, fifth and sixth generation—always selecting from his seedlings, as in the first generation those which promised best to realize his hopes. The peach and apricot sown in this man-

ner, did not produce excellent fruit till the third generation, the apple not till the fourth generation, and the pear not till the fifth or sixth generation. A good kind being obtained, it was increased by suckers, pieces of the root or layers, any of which modes M. Van Mons considered preferable to grafting. He remarks, that the best varieties threw up the fewest suckers. In the course of these experiments Dr. Van Mons raised 80,000 seedlings of the pear alone. In 1823, he published a catalogue of new fruits comprising about 460 varieties of the pear; most of them of excellent quality, and affording a succession for the table during the circle of the year. Many of these choice varieties were received by me in 1825 and 1827, from the Horticultural Society of London, and the fruit of some of them has been already exhibited at our horticultural shows. As these new pears are destined to contribute materially to the delicacies of our tables, I subjoin, for the benefit of amateurs, the names of a few, which are described and figured in colours, in the Pomological Magazine.

| *Names.* | *In eating.* | *Character.* |
|---|---|---|
| Beurre Diel, | November to January, | First rank for table, |
| Do. d'Aremburgh, | January to March, | Best cultivated, |
| Do. Rance, | December to May, | Best late, |
| Do. de Capiaumont, | October, | Delicious, |
| Duchess d'Angouleme, | November, | Finest of autumn, |
| Easton Buerre, | April to June, | Equal to best, |
| Gilogil, | March to May, | Very good, |
| Napoleon, | October and November, | An excellent pear, |
| Passe Colmar, | December to January, | Great favourite, |
| Princess of Orange, | October, | Fine quality, |
| Maria Louisa, | October and November, | Highly esteemed, |
| Bonne de Malines, | December and January, | Superior. |

Persuaded that the Flemish pears will be an important acquisition to our table fruit, I have applied through various channels, for all the good varieties which I have not already under cultivation. Among other means, I have made a request to Dr. Van Mons, through a friend at Paris, and have received assurances that my wishes shall be fulfilled.

The establishment of Horticultural Societies has contributed wonderfully to disseminate pomological information, and to facilitate intercourse and interchanges among horticultural men. I have many fruit trees growing, which were grafted in France, Germany, and in England, with varieties which originated not only in those countries, but in Italy, Denmark, Russia, and even Asia. And I observed, in a nursery catalogue, lately received of Jersey, the names of Stevens' Genesee pear, and the Jonathan apple, two fruits which I first named three years ago, and cuttings of which I sent to Europe the year following. Cuttings of the pear were taken from the original seedling tree, in Livingston, and kindly presented to me by Mr. Edwards, of Springfield. The fruit was subsequently forwarded to me by Mr. Ruggles. It is

a beautiful and excellent autumn fruit. The apple was sent to me (cuttings and fruit) by *Jonathan* Hasbreuck, Esq. of Kingston. It is an Ulster seedling, resembling in its high aromatic flavour and colour, the Esopus Spitzenburgh, but with less acidity than that old favourite.

While on this subject, I am desirous of calling the attention of the fruit-loving community to the meritorious exertions of some of our own citizens to increase the luxuries of our tables.

Mr. Howland, an intelligent farmer of Stillwater, cultivates most of the choice fruits of our country, and has originated several new varieties. He showed me, three years ago, growing on seedling trees, six or seven excellent varieties of the plum, all from the pits of a green gage, but all differing from this parent, and other known varieties: the blossoms having been fecundated by the aid of insects and winds, with the pollen of the fine surrounding varieties. Mr. Harman, also, of Schenectady, has been successful in raising several fine new varieties of the plum, worthy of propagation.

With sentiments of respect, I am, Sir, your obd't. serv't.

JESSE BUEL.

*Albany, December* 2, 1830.

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## Art. VII.—*On the Aracacha.*

[We find in a late number of the New-England Farmer, the following letter from Mr. Gideon B. Smith (editor of the American Farmer) to the President of the Massachusetts Horticultural Society, with the remarks of the latter on the Aracacha, which has been successfully introduced by Mr. Smith, "in a sound and vigorous state." This root is but little known to us, but the remarks of Mr. Dearborn show what an acquisition it will prove should we be able to naturalize it, which the great liberality of Mr. Smith, will enable us to test, for he has generously distributed those received, and we among others, are indebted to him for several which we have now growing in a vigorous state, and which we will give a more full account of when the result of our attempt to cultivate them is ascertained.]—*Editor So. Agr.*

" Baltimore, March 31, 1831.

*Sir*,—I have taken the liberty of forwarding to your address, by the brig Hamilton, captain Foster, a small box, containing a dozen roots of Aracacha, for the use of the Horticultural Society of which you are, I believe, President, and request their acceptance of it.

I have twice succeeded in importing this valuable root in a sound and vigorous state. Last fall I imported one hundred and forty roots, and have succeeded in preserving them perfectly

sound to the present time, by merely packing them in moist earth, and keeping them in a cellar protected from frost.—They are now growing finely in my conservatory, and I have no doubt of perfectly succeeding in their cultivation in the open ground.

I have just made my second importation, and the roots are equally as sound as the former ones. Those I send you are part of this last lot.

I am somewhat fearful that your season will not be long enough to allow the roots to attain the proper size; but that is all the doubt I have of their succeeding with you, provided the roots be planted and steadily kept in a shady cool situation.* This appears to be the only difficulty—the heat of our sun is their only enemy in this country. The reason, I apprehend, of the ill success of former attempts to introduce this valuable esculent, both in North America and Europe is, that *edible* roots, such as are sold in the markets of Caraccas, were taken, whereas the little offsets that spring from the large roots are the proper ones. Another cause may have contributed to this failure; I employed two gentlemen in two successive years to obtain *aracacha* for me but they could find none in all Colombia. I then learned it was called *appio* by the Colombians; using that name, I succeeded.

I am, with due respect, yours,

GIDEON B. SMITH.

*Ed. Am. Farmer.*

The present which Mr. Smith has so generously transmitted, is most worthy of our especial attention, and claims the assiduous care of such of the members as have the requisite means of making a thorough experiment.

The Aracacha has recently attracted the notice of most of the celebrated horticulturists in Europe, and is considered as destined to assume an important station among esculent vegetables. It is a native of Santa Fee, Bogota, New Granada and other parts of South-America, where it is considered the most useful of all the edible roots; being superior to the common and sweet potatoe, (*Convolvolus Batatas;*) it is extremely grateful to the palate; so tender that it requires but little cooking, and so easy of digestion, that it is the common practice, where it is cultivated, to give it to convalescents and persons who have delicate stomachs. Starch and a variety of pastry are made of its fecula, and it has all the advantages of Arrow-root and Tapioca.

In 1825, that distinguished botanist, the Baron de Schack arrived in the United States from Trinidad, and brought some of the roots of the Aracacha, for the purpose of introducing its culvation into the Southern and Middle States, where he believed it could be successfully done. Dr. S. L. Mitchell, ever conspicu-

*The temperature of their native climate is seldom above 70; they should have a rich black soil.

ous for his zealous attention to whatever may subserve the cause of science and the interests of his country, took great interest in the experiments.

Plants were confided to Mr. Michael Floy, a meritorious nursery-man of New-York, who attempted to acclimate them. He placed them in his green-house, where they passed the winter in security. The following spring when the frosts had passed, they were transplanted into the garden; but the season having been unusually dry, they perished; and Dr. Mitchell expressed doubts, as to the possibility of introducing the culture of the Arachaca so far north; still Mr. Floy believed that it could be propagated in the latitude of Long Island, and he attributed the loss of his plants, to a too sudden exposure to the air, in the open ground, without any protection against adverse vicissitudes of the weather.

An experiment was commenced by the Chevalier Soulange Bodin, at the horticultural establishment of Fromont, in April, 1829; and by a communication, in a number of the Journal of that Institution, for August last, he appears to entertain hopes of ultimate success and thinks this valuable vegetable may be cultivated in the southern departments of France, Spain and in Italy to advantage. He states that it is cultivated in the Botanical Garden of Montpellier and flourishes in that of Geneva. Experiments have also been made in the Garden of the London Horticultural Society at Chiswick, at Bury-Hall, by Robert Barclay, Esq., at Plymouth, and by the great nursery-men, Messrs. Loddiges.

The Aracacha has been successfully introduced into Cuba and Jamaica, and if our climate should prove too cold, there is but little doubt it can be propagated in the Southern States, and may become the rival of the sweet potatoe.

The roots, or small tubers, are planted in South America, about twenty inches apart, with a slight inclination towards the south; when they sprout above the ground, they are managed like the sweet potatoe. As the flowers begin to form, they are carefully plucked, in order to concentrate the vigour of vegetation in the roots. At Santee Fee, where the mean temperature is about 73 degrees of Fahrenheit's thermometer, the roots acquire their full growth in six months. In Jamaica where the Aracacha flourishes remarkably well, it is cultivated in rather poor land, such as that of the mountains of St. Andrew, where there falls but little rain.

It is well known to you, that Mr. Smith to whom we are indebted for the Aracacha roots, succeeded John S. Skinner, Esq. as Editor of the American Farmer. The latter gentleman has acquired a deservedly high reputation, for his indefatigable efforts, to advance the science and art of agriculture and gardening, throughout the United States; and Mr. Smith is actively pursuing the same meritorious course, in a manner which must

secure to him the respect of the intelligent planters of Maryland, and the benedictions of his fellow-citizens in every section of the republic. The labours of those gentlemen are not only duly appreciated, by the cultivators of the soil, on this side of the Atlantic, but have received the commendations of those, on the Eastern continent.

If a winged Mercury transmitted intelligence, among the gods of ancient mythology, the genius of the moderns has more than supplied his office. By the art of printing, innumerable heralds are incessantly sent forth, who interchange the tidings of every region of the globe; and with such certainty and celerity, that they have not only received the name, but far surpassed the services of Jove's fabulous messenger. It is thus that all the discoveries and improvements, and whatsoever is useful or interesting to man, in the glorious career of civilization is immediately made known; and individuals, distinguished for their intellectual attainments, and arts of philanthrophy, instead of being claimed as the citizens of a single nation, are hailed as compatriots in the vast republic of letters, science and arts, and are universally honored as the benefactors of the human race.

Respectfully submitted, by

H. A. S. Dearborn.

*Pres. Mass. Hor. Soc.*

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ART. VIII.—*Grapes of the Second Growth; by* N. Herbemont.

[FROM THE AMERICAN FARMER.]

Columbia, S. C. Dec. 24, 1830.

*Dear Sir*,—Seeing in your most valuable agricultural journal of the 17th inst. No. 40, a short article entiled "Grapes of the second growth," I presumed it would not be unacceptable to some of your readers to have the mode of producing them at pleasure. To those who raise grapes for the table, it must be an advantage to be able to obtain them late in the fall as well as at the usual season.

To attain this object, nothing more is necessary than to induce in the summer, the growth of the buds intended by nature to furnish fruit the following year. This is very easily done with a vigorous vine; but not with a weak one, and if it could be done, it seems to me that it would be unadvisable to attempt it, lest the vine be materially injured by it. Even with very strong vines it would not be proper, perhaps, to induce such a growth on more than one or two branches of a vine.

After the vine has blossomed, at the usual season, and the fruit is formed, select one or more strong and well grown shoots of the present spring's growth, and prune them as you would in the winter prune the shoots of the preceding year's growth, taking particular care to suppress all the side shoots or interleaves, as also the fruit of those branches. The effect of this will be that the buds which, but for this operation would have remained dormant till the next spring, will grow and produce fruit which will ripen one month or two later than that on the other parts of the vine. It is easily conceived that such an operation may be injurious, in this, that the buds of this second growth may not be sufficiently matured to produce a good crop the following year; and for this reason, I think it advisable to take only one branch or two of a vine, and suppress it altogether in the following winter pruning. When, however, as was the case this fall, no severe frosts occur till very late, such second growth may be sufficiently ripe to be treated as the rest of the vine. The cultivator will, however, exercise his judgment on the propriety of this. Vigorous vines only, as I said above, are to be subjected to this process. Those which have succeeded best with me are, my Madeira, which bears it without any apparent injury, and also the Isabella. These are the only two kinds on which I have tried the experiment, except on weak white grapes on which it failed; but I can see no reason why other strongly growing vines would not likewise bear it. It is to avoid the growth of these buds that writers on the subject of the vine (in this country) recommend not to top the shoots of the vine, unless it be done very late, when the fruit is nearly ripe, and with a view to promote its maturity, an effect, which I doubt much, is promoted by the operation. This was not, at first, discovered by an act of design, but rather by an accidental one. Many years since I was induced to top the bearing shoots of some of my vines, with a view to promote the growth and maturity of the fruit. I failed in my object; but obtained a second crop which matured, however, unequally and not sufficiently well for wine, though the grapes gave me a succession of fine fruit for the table. I have since occasionally performed the necessary operation, which is merely to cut the top of the shoots down to four or five buds, taking off at the same time, as stated before, all the interleaves or side shoots. If you think, Sir, the above of consequence enough to have a place in the American Farmer, insert it, and believe me with respect, your obedient servant.

N. HERBEMONT.

## Art. IX.—*On Breeding Animals.*

[FROM THE GENESEE FARMER.]

We do not know of a more common error than exists in the opinions of farmers respecting the breeding of horses, cattle, sheep and hogs. Most of them think that they cannot improve their stock without crossing with some other, and for this purpose select the largest males they can find.

We do not rightly understand the meaning of the term *breeding*, as applied to horses and cattle, unless it is to improve their valuable qualities. When we say *a high-bred horse*, we mean a horse of valuable qualities. As different animals are bred for different purposes, the breeder, before he commences, should inform himself, and endeavour to fix upon an imaginary standard for his animals, in which are congregated the most valuable points, all local circumstances considered. When he has thus matured his judgment, he should be steady to his purpose, and remember that he is engaged in a work of importance, and one which will be perfected in proportion to the time it is steadily pursued.

In maturing his judgment, he should not only make himself acquainted with the external form of animals, but he should become familiar with their internal structure. In the former he may improve himself by examining the most approved breeds, in the latter by studying their anatomy; "for," says a modern writer on this subject, "the external form is an indication only of internal structure. The principles of improving it must, therefore, be founded on a knowledge of the structure, and use of internal parts."

When a breeder has matured his judgment, hit upon his standard of perfection, and selected his stock, having the most good points of those he can procure, let him be very careful about any innovations upon his breed. He should become fixed in certain rules, which he should never depart from. First, that to increase an animal in size above the natural family, is often attended with a loss of valuable points. His object should be, therefore the improvement of the latter.

Let every farmer remember that the greatest benefits which have been obtained in breeding, for the last hundred years, have been where they breed "*in and in.*" But the common error which I first referred to, is the universal desire to breed from large males with small females.

This is diametrically opposite to the course which has been pursued by the best breeders in England. On the contrary, they select the males smaller in proportion than the females. The following is from the writer above referred to: "To obtain the most approved form, two modes of breeding, described as the *in and in*, and *cros-*

*sing* modes have been practised. The first mode may be the better practise, when a particular variety approaches perfection in form; especially for those who may not be acquainted with the principle upon which improvement depends. *When the male is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionably larger than the male, the offspring is of an improved form.* The proper method of improving the form of animals, consists in selecting a well formed female, proportionately larger than the male.

The improvement depends upon this principle, that the power of the female to supply her offspring with nourishment, is in proportion to her size, and to the power of nourishing herself, from the excellence of her constitution. The size of the fœtus is generally in proportion to the male parent; and therefore when the female parent is disproportionately small, the quantity of nourishment is deficient, and her offspring has the disproportions of a starveling.

But when the female, from her size and good constitution, is more than adequate to the nourishment of a fœtus of a smaller male than herself, the growth must be proportionably. The larger female has also a larger quantity of milk, and her offspring is more abundantly supplied with nourishment after birth. *Abundant nourishment is necessary to produce the most perfect formed animal, from the earliest period of its existence until its growth is complete.*

The power to prepare the greatest quantity of nourishment from a given quantity of food, depends principally on the magnitude of the *lungs*, to which the organs of digestion are subservient. To obtain animals with large lungs, crossing is the most expeditious method, because well formed females may be selected from a variety of large size, to be put to a well formed male, of a variety that is rather smaller.

By such a mode of crossing, the lungs and heart become proportionately larger, in consequence of a peculiarity in the circulation of the fœtus, which causes a larger proportion of the blood under such circumstances, to be distributed to the lungs than to the other parts of the body; and as the shape and size of the chest depend upon that of the lungs, hence arises that remarkably large chest which is produced by crossing females that are of larger size than the males."

Now allowing the above to be correct, how inconsistent is the course pursued by most of our farmers. Every day our eyes bear testimony of the opposite course. We see horses led about the streets which have nothing but weight of carcase, and perhaps colour, to recommend them to farmers as stock to breed from. Let such farmers as would improve their breeds be careful in the selection of the females, and remember that *steady and full feeding is one very important part in the improvement of stock of all sorts.*

## Art. X.—*On Improvement of Corn.*

[FROM THE NEW-YORK FARMER.]

The Editor of the *American Farmer* has been several years in the habit of improving corn by *crossing* different varieties, with decided advantage. If he has a variety with small ears, which he deems good in other respects, he plants it in the rows with another kind with large ears, that flowers at the same time; and, at the time of the tassels appearing, carefully cuts away the male flowers (or tassals) of the large-eared kind. By this operation, large ears are produced of the small-eared kind. There are some kinds of early corn, which, though excellent in other respects for green corn, are very much injured by the colouring matter of their red cobs. This he attempted to remedy last summer by transferring the corn from the red to the white cob in the same way, and he thinks with success. He planted some of the red-cob Tuscarora, which he thinks the best early green corn, in the rows with the largest eared white-cob sugar-corn he could find, about half and half. As the tassels of the sugar corn made their appearance, he carefully cut them away, leaving the whole to be supplied by the pollen from the tassels or male flowers of the red-cob Tuscarora. The result was, he had the Tuscarora corn on the white-cob of the sugar-corn, as he desired. From his experiments, the Editor concludes, that any variety of corn may at pleasure, thus be transferred to the cob of any other variety that flowers at the same time; and, that if a large-eared kind can be found that flowers at the proper time, the smallest-eared kind may be made to produce large ears by the above process. He has not extended his experiments to the improvement of the cob of field corn; but, has no doubt, that by the same process, the thick cob of some kinds may be improved. Suppose the thick-cob kind were planted in the row with some other that usually has a small cob, and the tassels of the latter cut off as above directed, would not the desired variety of corn be obtained on the small cob?

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## Art. XI.—*On the Causes which tend to Produce Frosts; by* D. T.

[FROM THE GENESEE FARMER.]

A diminution of temperature in the soil, is either caused by the contact of colder bodies which absorb a portion of its heat; or by radiating its heat, when colder bodies do not come in con-

tact. With the first cause, every person is familiar, and it has been known from time immemorial; but the second cause is classed with the discoveries of modern chemistry.

A cool afternoon in spring or in autumn, portends a frost if the sky be clear and calm; but the fears of the gardener subside if he discover clouds rising in the West, although no increase of heat is expected from that quarter, because *neither frost nor dew is formed in a cloudy atmosphere.*

With a clear serene sky, however, so great is the radiation of heat that frost may happen at the ground when the air is several degrees above the freezing point.*

To many, this will seem a wonder. The principle of radiation is indeed a wonder which has not been explained. Its operation, however, is easily shown. Take a closed vessel with a polished metallic surface---fill it with boiling water---and note the time that it takes to cool. Pour out that water---give the vessel on the outside a coating of thin glue---and again fill it with boiling water. As the hot water is now shielded from the cool air of the apartment, it might be expected to cool more slowly; but so singular is the principle of radiation, that it will cool more than six times as fast. Again, empty the vessel---remove the glue---apply a coat of lampblack---fill the vessel with boiling water as before, and the heat will pass off more than eight times as fast as it did from the clean polished surface.†

Professor Provost‡ of Geneva, (Switzerland) first suggested that "a mutual exchange of caloric takes place between all bodies, of whatever temperature, and this theory appears to be generally adopted." It cannot, therefore, be expected that boiling water would cool in an apartment of the same temperature, because there could be no loss of heat by such exchange. Neither is the loss of heat from the soil so great as to produce frost in a clear, calm night in summer, when that soil and every projecting object have a temperature far above the freezing point.

Winds are not favourable for the production of frost,--for though the radiation may not be diminished, the air which is warmer than the surface of the ground, by constantly changing its position, commingling and sweeping that surface, imparts a portion of heat.

The radiation of heat from the ground is intercepted by thick clouds, or rather the heat is radiated back; but from a clear sky at night there is no return. It is observed that at such times, any covering, however partial, lessens the quantity of white frost—even the naked branches of leafless trees. It was also remarked before the cause was understood, that when the tem-

* Scheele discovered that "radiant heat passes through the air without heating it."—Libr. Useful Knowledge.

† Brande's Chemistry. ‡ Conversations on Chemistry.

perature is equal, there is less frost in smoky weather than in clear, calm nights, when the stars are unusually brilliant.

In the old volume on gardening by Lawrence, *(printed* in 1717,) I found a curious paragraph, which evidently refers to this phenomenon. His skill as a gardener was successful, but his philosophy fell short of the mark.

"Most of our frosts and blasts, both in spring and autumn, *fall perpendicularly;* and therefore the more any thing lies open and exposed to *this perpendicular descent of vapors*, the more will it be subject to be frozen or blasted. When a fruit tree has been [trained] against a *slope wall*, for the convenience of receiving more of the sun's rays, we always find that *that* is the first and most blasted, both in spring and autumn. This therefore being the true state of the case with respect to most of our destructive blasts, *horizontal shelters* are the best guard and defence against *perpendicular frosts.* Tiles or thin bits of board fastened in the wall [so as to project an inch and a half were] found to answer to a wonder, and to secure the fruit wherever they were placed."

Here it is proper to notice, that bodies radiate heat from every point of their surfaces; that nearly half the radiated heat from a vine nailed up, would therefore be intercepted by the wall; and that a bud (or bunch) immediately below one of these projections (or "horizontal shelters,") could scarcely radiate to any part of the heavens.

With these explanatory remarks, I wish to introduce a passage from *Loudon's Encyclopædia of Agriculture*, which must be interesting to every intelligent gardener, and for a copy of which I am indebted to the New-York Farmer.

"I had often, observes Dr. Wells, *in the pride of half knowledge*, smiled at the means frequently employed by gardeners, to protect tender plants from cold, as it appeared to me impossible, that a thin mat, or any such flimsy substance, could prevent them from attaining the temperature of the atmosphere, by which alone I thought them liable to be injured. But when I had learned that bodies on the surface of the earth become during a still and serene night, colder than the atmosphere, by radiating their heat to the heavens, I perceived immediately a just reason for the practice which I had before deemed useless.---Being desirous, however, of acquiring some precise information on this subject, I fixed perpendicularly in the earth of a grass-plot, four small sticks; and over their upper extremities, which were six inches above the grass, and formed the corners of a square the sides of which were two feet long, drew tightly a very thin cambric handkerchief. In this disposition of things, therefore, nothing existed to prevent the free passage of air from the exposed grass to that which was sheltered, except the four small sticks; and there was no substance to radiate heat downwards to the

latter grass, except the cambric handkerchief. The temperature of the grass which was thus shielded from the sky, was upon many nights afterwards examined by me, and was always found higher than that of the neighbouring grass which was uncovered, if this was colder than the air. When the difference in temperature between the air several feet above the ground and the unsheltered grass did not exceed five degrees, the sheltered grass was about as warm as the air. If that difference, however, exceeded five degrees, the air was found to be somewhat warmer than the sheltered grass.---Thus upon one night, when *fully exposed grass was eleven degrees colder than the air*, the latter was three degrees warmer than the sheltered grass; and the same difference existed on another night when *the air was fourteen degrees warmer than the exposed grass.* One reason for this difference no doubt was, that the air which passed from the exposed grass, by which it had been very much cooled, to that under the handkerchief, had deprived the latter of a part of its heat; another, that the handkerchief, from being made colder than the atmosphere by the radiation of its upper surface to the heavens, would remit somewhat less heat to the grass beneath, than what it received from that substance. But still, as the sheltered grass, notwithstanding these drawbacks, was upon one night (as may be collected from the preceding relation) eight degrees, and upon another eleven degrees warmer than grass fully exposed to the sky, a sufficient reason was now obtained for the utility of a very slight shelter to plants in averting or lessening injury from cold, on a still and serene night.

"*The covering has more effect when placed at a little distance above the plants* or objects to be sheltered. A difference in temperature of some magnitude was always observed on still and serene nights, between bodies sheltered from the sky by substances touching them, and similar bodies which were sheltered by a substance a little above them. I found for example, upon one night, that the warmth of grass sheltered by a cambric handkerchief raised a few inches in the air, was three degrees greater than that of a neighbouring piece of grass which was sheltered by a similar handkerchief actually in contact with it. On another night, the difference between the temperatures of two portions of grass shielded in the same manner as the two above mentioned from the sky, was four degrees. Possibly, continues Dr. Wells, experience has long ago taught gardeners the superior advantage of defending tender vegetables from the cold of clear and calm nights, by means of substances not directly touching them: though I do not recollect ever having seen any contrivance for keeping mats, or such like bodies, at a distance from the plants which they were meant to protect." D. T.

# PART III.

## MISCELLANEOUS INTELLIGENCE.

*Sweet Potatoe.*—A new variety of this root grown in the forcing garden of Versailles, is thus noticed in the 30th No. of the Gardener's Magazine—"A sort of Sweet Potatoe is grown here, obtained from St. Domingo, and there called the '*Quarantin*' which, as the name imports, produces tubers fit to eat in 40 days." In a country like ours, where the Sweet Potatoe furnishes so large a portion of the food consumed both by man and animals, a variety like the one mentioned above would prove valuable, if it possesses any portion of the good qualities of those now grown by us. These last are not dug even for immediate use in less time than from 130 to 150 days. To a planter who has made a short crop of provisions, the Quarantin would be of great value.

*Swiss Chard—mode of cooking.*—The following directions for dressing this vegetable, has been politely furnished us by Mr. G. B. Smith, to whom we are indebted for all the seeds we have distributed among our friends.—*Editor So. Agr.*

"We cook the Swiss Chard as follows—trim the leaf from the stem with a knife, and boil the stem in water with a little salt till tender, then take them out and drain all the water off, put them in a stew-pan, pour on some drawn butter, (*sauce blanche*, as the French call it) cover them close and stew them for 15 minutes. The dish is then equal (to my palate) to asparagus.

The *leaf part* is cooked in the same way, and some cook the leaf and stem together, but I prefer them separately. Cooked thus the leaf is fully equal to spinach—to my palate of course. The French have various modes of dressing Swiss Chard, but I am unacquainted with any but the above."

*A New, Beautiful and Valuable Fruit brought from Council Bluffs and bearing in New England.—Extract of a letter from J. Winship, Esq. to J. S. Skinner, Postmaster of Baltimore.—My Dear Sir,*—We have now growing in our grounds a tree ten feet high, the produce of the seed you were so kind as to send me eight years ago, called the Shephirdia or Silver Capp'd Buffalo Berry Tree. The ensuing autumn we shall have a quantity of them, and some of them are very much at your service. It is one of the greatest acquisitions of the fruit-bearing kind our country can produce: for beauty of foliage, fulness, goodness, and elegance of fruit, it is unrivalled by any new production, the fruit is about the size of the red Antwerp currant, much more rich to the taste, and forms one continued cluster of fruit on every branch and twig.—*Amer. Farmer.*

*Capers.*—The caper tree *(Capparis spinosa)* "has the habit of the common bramble; it grows in the south of Europe, especially on rocks and ruins. The chief supply of caper buds is from Sicily; but the plant is cultivated in the neighborhoood of Toulon, in orchards, in the intervals between fig and olive trees; and in the neighborhood of Paris, where it is trained on low walls, and *the shoots during winter laid down and covered*

*with soil to protect them from the frost.* In [England] it has stood the winter in the open air in some situations, and by raising from the seed for several generations might probably be naturalized. A plant stood near a century against the wall of the garden of Camden House, Kensington; it produced many flowers annually, though the young shoots were frequently killed to the stump during winter.

"As a pickle, *the flower buds* of the caper are in great esteem throughout Europe. In Italy the unripe fruit is prepared in the same way as the flower buds; both are highly acrid and burning to the taste. In the Isles of the Mediterranean, and near Toulon, the flower buds of the caper are gathered just before they begin to expand, which forms a daily occupation during six months, when the plants are in a flowering state. As the buds are gathered they are thrown into a cask among as much salt and vinegar as is sufficient to cover them, and as the supply of capers is increased, more vinegar is added. When the caper season closes the casks are emptied, and the buds sorted according to their size and colour, the smallest and greenest being reckoned the best, and put into small casks of fresh vinegar for commerce. They will in this state keep fit for use five or six years. The best capers are called nonpareilles, and the second best capucines.

"Most of the species are very showy when in flower. Ripe cuttings grow readily in sand."—*Ency: of Plants.*

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*Preserving Fruits.*—Mr. Smith—A member of the Dublin (Ireland) Society, has presented me with the following method of preserving fruits of different kinds about twelve months, for which a premium of ten guineas was given by the Dublin Society, to Seignor Ignacia Buonsegna. I am desirous of having it disseminated through the medium of your widely circulating paper. By so doing you will, as the proverb says, "kill two birds with one stone," as you will confer a favor on the public, as well as on

Amicus Humani Generis.

It is necessary to pull the fruit two or three days before you begin the process.

Take care not to bruise the fruit, and to pull them before they are quite ripe.

Spread them on a table, over a little clean straw to dry them; this is best done on a parlour floor, leaving the windows open to admit fresh air, so that all the moisture on the skin of the fruit may be perfectly dried away.

Pears and apples take three days—strawberries only twenty-four hours, these latter should be taken up on a silver three pronged fork, and the stalk cut off without touching them, as the least pressure will cause them to rot; take only the largest and fairest fruit. This is the most tender and difficult fruit to preserve; but if done with attention will keep six months; there must not be more than one pound in one jar.

Choose a common earthen jar with a stopper of the same, which will fit close.

The pears and apples then, sorted as before, must be wrapped up separately in soft wrapping paper, and twist it closely about the fruit, then lay clean straw at the bottom, and a layer of fruit; then a layer of straw, and so on until your vessel is full; but you must not put more than a dozen in each jar; if more, their weight will bruise those at the bottom.

Peaches and apricots are best stored up wrapped each in soft paper, and fine shred paper between the fruit and also the layers. Grapes must be stored in the jar with fine shred paper, which will keep one from touching the other as much as possible. Five or six bunches are the most which should be put into one jar: if they are large not so many; for it is to be understood that whenever you open a jar, you must use that day all the fruit that is in it.

Strawberries as well as peaches should have fine shred paper under and between them in the place of straw, which is only to be used for apples and pears. Put in the strawberries and the paper, layer by layer, when the jar

is full put on the stopper, and have it well luted round, so as perfectly to keep out the air. A composition of rosin or grafting wax is best: let none of it get within side the jar, which is to be placed in a temperate cellar; but be sure to finish your process in the last quarter of the moon.

Do not press the fruit, as any juice running out would spoil all below.

*American Farmer.*

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*Hilling Corn.*—Erastus Ware, of Salem, Mass. says of an excellent field of corn, which obtained a premium, that it was hoed three times, but not hilled, as has been customary; and upon a comparison of that not hilled, with a small piece which was in some degree hilled, after a severe gale, he is satisfied that no advantage is gained by hilling, as was formerly practised. His opinion is, that there is no benefit to be derived by hilling corn; and corn raised on a flat surface, when the weeds are destroyed, and the ground kept loose, is by no means so likely to suffer by the drought, or to have its roots impeded in the search after their proper nutriment, as where the ground is drawn up round the stalk in a high and steep hill.—*Genesee Farmer.*

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*Vegetable Physiology.—Circulation of Sap.*—At the sitting of the Academy of Sciences, on the 19th of September a report was made by M. de Mirbel on certain observations respecting vegetable anatomy and physiology communicated by M. Shultz, professor of the University of Berlin. These observations tend to show a real circulation in the great division of phanerogamous plants resembling that of the blood in animals, and the proofs placed before the persons to whom the communication was referred by the Academy, have led them to regard his discovery as incontestible. In the year 1820, M. Shultz, while examining the plant chelidony conceived the first idea of the circulation in question, and afterwards having directed his researches to many vegetables with one or two cotyledons, and belonging to different genera, he infered that this circulation was common to all the species. M. de Mirbel remarks, that it is astonishing that among so many observers who have devoted themselves to the study of animal and vegetable physiology no one should have remarked this fact, and still more so, that since it had been announced no person in France had been able to prove its reality. The preparations for observing it are, however, simple. M. Shultz raised by the aid of a sharp instrument a portion of the epidermis or outer bark of the *Ficus elastica* leaving the cellular tissue and the vessels of the stipule naked. A fragment of this organ is plunged into water and placed before the microscope, when the observer sees the whole vascular apparatus destined for the circulation, composed of long parellel bundles of vessels connected with each other by a loose net-work of vessels of the same kind. In these the sap is seen flowing in little capillary torrents. The committee of the Academy not thinking their first observations sufficient, M. Shultz showed them the movement of the sap through the epidermis of an entire leaf, a plant of chelidony, to the stalk of which it was yet attached. A clear day is chosen, the microscope is so placed, that its mirror shall reflect the rays of the sun, the leaf is moistened and placed so as to direct the sight upon a vein thin enough to admit the passage of the light. By means of the transparency of the tissue a scintillation is then observed, owing to the refraction of the luminous rays by the particles which the sap carries along with it, and if the vessels are near to the epidermis the direction of the current is clearly manifest.

*Amer. Jour. of Science and Arts.*

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*Salsify, or Vegetable Oyster.*—This plant is a hardy biennial, which has, within a few years past, become a favourite with our gardeners.

It is cultivated for the roots, which are about the size of small carrots, of a dingy white color, with a milky juice. When cooked they have a flavor not unlike oysters, from which circumstance is derived their common name. To cultivate this plant the seeds should be sown in the fore part of

May, in beds of deep rich earth, prepared the same as for parsnips—their general culture and time of use being the same, and also their mode of preservation.—To save seeds a few plants should be put in the ground in the spring, when they will shoot up about four feet high. The flowers are of a dull purple color, which are followed by seeds about an inch long, attached to a feather, like the seeds of the dandelion. The young stalks and leaves of this plant are sometimes boiled, and make an excellent dish.

We think this plant will be more generally cultivated, as gardeners become more acquainted with it, as it is the best substitute for oysters that has yet been discovered, and may be cooked in all the different ways in which they are, and in some dishes it would be very difficult to distinguish the two. Having cultivated them for a number of years, we most earnestly recommend them to our western farmers and gardeners, as a vegetable deserving a place in every garden, as they are of easy culture, not liable to be destroyed by insects, and as giving a variety to the table through the fall, winter, and spring months. *Genesee Farmer.*

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*Orange Farm.*—The following letter from the proprietor of the Orange Farm, will be read with interest. The only remark we have to make on laying it before our readers, is—"go and do likewise."

Mr. Smith: *May*, 4, 1831.

Under an impression that the agriculturists of our country, with a few exceptions, did not employ capital enough in their business, I about twelve years since, determined to carry my ideas into effect upon my Orange Farm consisting of 400 acres. After the desired fertility had been given to the soil. 30 acres of it were converted into a garden, and 370 acres into a dairy farm. Of these 370 acres, about 70 are in wood, and about 300 under cultivation.

The cows are in number 100—sometimes more, and sometimes less. They are kept in warm, but well ventilated stables throughout the winter, and part of the spring and autumn. They are not exposed to cold rains even in summer. They run during the summer on luxuriant pastures, each of which affords a comfortable shade. So much importance is attached to shade, that sheds have been erected over the troughs where they get their drink. As there is no running water on the farm, we have to depend on pumps. And it may not be out of place here to state, that two dogs, one at a time, pump all the water, and cut all the corn stalks, straw and *hay* used for all the cows and other animals of this farm. These cut articles, mixed with cornmeal, bran, shorts, and roots, are cooked by means of a very simple steam apparatus for their food during the winter, with occasional variations.

The cows are at all times in the stables clean, by being kept clear of their own dirt, by means of a well constructed drain so fixed as to receive all their dung and urine.

Of the sales of the products of this dairy farm, there has been for a series of years a progressive increase. The account of the sales of last year, as rendered to me by my manager on the 1st January last, you have below; and I am given to understand that it will be more this year. In this statement the proceeds of the garden of 30 acres are not included.

As the expenses of repairs, of buildings, and of every other kind, are paid by my manager, I have not allowed myself to pry into them very closely. I have contented myself with knowing that he has to deliver to me, and that he does deliver to me, without limitation every day, whatever quantity my family may want of fresh butter, cream and milk, and that he has to pay to me, and does pay to me, in cash every Saturday a satisfactory net amount of rent.

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Amount of Sales on Orange Farm for 1830.—Milk, $4,822 20, Butter 1,779 36; Beef, 1,201 84; Veal, $184 79; Pigs, 7 250; Vegetables, 455 98 Hay, 1,143 06 :—Total $9,659 73.—*Amer. Farmer.*